THE IRON TRADE REVIEW

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STEADY BUYING

WITH PROSPEROUS CONDITIONS BEING MAINTAINED.

Some Prohibitive Prices of Pig Iron—New Announcements Concerning Tin Plate and Merchant Pipe—Coke Strong.

Buying has continued steadily during the past week, giving ample evidence of general prosperity in the iron and steel business, but the period has not been characterized by the placing of orders of unusual size or importance. Among conservative interests there is a growing feeling that, if there is any danger in the present situation, it lies in the tendency to advance prices too rapidly, especially for raw materials. For this reason interest is centered in the coke market. The possibility of prices of ore being advanced is also being considered, although higher ore prices would have little effect on pig iron for the first half of next year.

Coke Prices Advancing. Numerous furnace interests have made contracts for coke at prices ranging from $2 to $2.50 at the ovens, and the price for the best grades of furnace coke is now $2.50 to $2.60, while for prompt shipment $2.65 has been paid. The advance in the price of coke and the uncertainty in regard to obtaining prompt delivery make furnaces more cautious about their quotations on pig iron for next year.

Ore Prices Discussed. Formal consideration of the prices of ore for 1906 has not been given by the mining interests, but it is evident that there will be some difference of opinion on that subject—some companies favoring an advance of at least 50c per ton, while others hold that the advance should not be over 25c per ton. The total shipments for the season will probably be about 32,000,000 tons.

The Pig Iron Situation. Pig iron prices in the South are firm and tending upward. While some iron was sold late last week at Birmingham at $12 to $12.25 for No. 2, some of the largest producers are out of the market, which is now strong at $12.50. Since the recent sales of Bessemer were made to the Steel Corporation at $15, two leading sellers have withdrawn from the market with the expectation that $15.50 will prevail when they are again ready to enter. Quotations on foundry iron in the central West show an increasing tendency to name prohibitive prices for next year's delivery. One Cleveland interest has advanced its quotation on No. 2 foundry to $16 at its plant and some valley interests have taken similar action, which is equivalent to withdrawing from the market. Prices in the East are rising, and to meet increased demands a number of furnaces of rather antiquated type are being blown in. The price of ferro-manganese is advanced to from $54 to $55, Pittsburg.

Merchant Pipe Rate Card. The principal maker of merchant pipe has issued a new rate card, showing discounts of 4 points more on steel pipe and 3½ points more on iron, as compared with the last card issued. This action is not, however an indication of weakness, but merely makes the announced quotations the same as the prices which have been, in fact, prevailing. The market is stronger than it was a few weeks ago.

Tin Plate Quotations. A new system of making sales of tin plate has been announced by the principal producer. Although this system does not make much change in actual prices, it has been received with some surprise, as an advance was rather expected. The American Sheet & Tin Plate Co. is now operating about 51 percent of its capacity, and at an early date will put 10 mills at Monessen in operation, increasing its active capacity to about 56 percent.

Bar Market Is Active. An advance in the price of steel bars is expected, but a meeting of the manufacturers has not yet been held. A Chicago mill has advanced its quotations for bar iron to 1.80c, but the usual quotation is 1.70c, Youngstown. The market for bar iron is very strong, and the Empire Rolling Mill Co., of Cleveland, has completed its arrangements for doubling the capacity of its plant.

Rail Orders Declined. Heavy buying of rails is apparently over for the present, although during the past week a Chicago mill booked orders for 50,000 tons and was compelled to decline an order for 50,000 additional tons on account of inability to give required delivery. The American Ship Building Co. has placed an order for 30,000 tons of plates at Chicago.

Cast Iron Pipe Strong. Among the orders for cast iron pipe just closed was one from Newark, O., for 4,700 tons and one from Chicago for 700 tons, both going to the leading producer. The scrap market is strong, with prices in most places advancing, but a great deal of the buying is by dealers who are storing scrap with the expectation of still higher prices.

THE WEEK IN IRON CENTERS.

PITTSBURG.

National Tube Co. Issues New Card—Tin Plate Developments—Pig Iron Firm.

OFFICE OF *The Iron Trade Review*,
521 PARK BUILDING, October 4

The general tone of the iron and steel market is a shade quieter than a week ago. The rush of pig iron buying appears to be over, while billets appear to be in less demand, although there is just as little tonnage offering as there was.

In finished steel products generally the demand is well maintained and the whole finished steel market is in a healthy condition.

The National Tube Co. has issued, under date of Oct. 2, a new card, which recognizes the actual market. Since the beginning of the year the official list has not represented the actual market, which has declined as the official prices have been advanced. The market is firmer than a fortnight ago, the independent mills being now quite well filled with business.

The American Sheet & Tin Plate Co. has put into force a new system of making tin plate prices, the "official" price being unchanged, but instead of there being two rebates and some special concessions in individual cases a net invoice price is made, subject only to the regular five-cent rebate, by which prices are put on the lowest level recently prevailing. Some surprise has been expressed at the action, inasmuch as the tone of the market has lately shown some improvemnt.

The sales representatives of the Carnegie Steel Co. are closing a two days' meeting in Pittsburg.

Pig Iron.—Since the purchases of Bessemer pig by the steel corporation the two leading sellers of Bessemer have withdrawn from the market, with the intention, it is understood, of coming in again, should $15.50, valley, be reached in the open market. Sales have been light and the market has not been well tested. Some Bessemer can be picked up at $15.00 and $15.25, at which we quote the market, but it is well established that there is not much iron to be had at these prices, and with any large demand the $15.50 mark could easily be reached. The steel corporation last week took 15,000 tons of Bessemer from W. P. Snyder & Co., 25,000 tons from the Bessemer Furnace Association and 5,000 tons from an outside interest, all at $15.00, valley, with a small tonnage to be delivered in September and the balance over the month of October, making a total of 45,000 tons, and a total of 80,000 tons since purchases of outside Bessemer were resumed a month ago. Basic has been rather quiet and is on about the same level as Bessemer. Sales of foundry iron have dwindled this week after the large purchases in the preceding fortnight, and there is not nearly so much inquiry. Consumers are well covered through this year and in some cases into next year, while furnaces are equally well sold up. It is very doubtful if $15.00 at furnace could be shaded for No. 2, while some furnaces have marked up their prices to $15.25 and $15.50. Forge has been quite active and prices have sharply advanced. A sale of 1,500 tons of a favorite brand has just been made at $14.50, valley, or $15.35, delivered Pittsburg, but the market on ordinary brands is a trifle less than this. We revise prices as follows:

Bessemer, Valley	$15.00 to $15.50
Bessemer, Pittsburg	15.85 to 16.35
No. 1 Foundry, Pittsburg	16.35 to 16.85
No. 2 Foundry, Pittsburg	15.85 to 16.35
Gray Forge, Pittsburg	15.15 to 15.25
Basic, Valley	15.00 to 15.50
Basic, Pittsburg	15.85 to 16.35

Ferro-Manganese.—The market has advanced further. There is very little ferro to be had for early shipment and on long contracts the foreign producers are very stiff and cannot make very regular deliveries. There is no domestic to be had. We note a sale of 150 tons a few days ago for immediate delivery at $55.00, delivered Pittsburg, but this price could hardly be duplicated for immediate delivery, and we quote this price for early delivery, with large lots about $54.00.

Billets.—Inquiry has not been so heavy since a large tonnage was turned down lately, and the market is now rather quiet. There is no more steel to be had than there was and any insistent demand would no doubt force prices upward. Sales have been light and the market is largely nominal at about $25.00 for Bessemer and $26.00 for open-hearth billets, ordinary carbons and sizes. Small billets are not quotable. Forging billets are moving in small lots at high prices, $28.00 being about the minimum. The Carnegie Steel Co. has this week started the Columbus steel works, as expected, and the plant will make sheet bars for some time to come.

Muck Bar.—We note a sale of 300 tons of muck bar at $28.00, delivered Pittsburg, or $27.05, f. o. b. Youngstown, at which we quote the market.

Skelp.—The market is very firm, but has not been extremely active. Producers are well sold up for this year. We quote prices unchanged as follows: Bessemer steel, grooved, 1.55c; sheared, 1.60c; open-hearth, grooved, 1.60c; sheared, 1.65c; iron, grooved, 1.60c to 1.65c; sheared, 1.65c to 1.70c.

Rails and Track Material.—The heavy buying of rails appears to be over for the present, but small orders are being booked right along. The mills now have booked directly for next year nearly or quite 1,750,000 tons, besides being certain to carry over considerable tonnage from this year. Spikes are very firm at a minimum of $1.75 and are regarded as relatively low. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28.00; carload lots and less than 500 tons, $30.00; less than carload lots, $32.00; light rails, 16-lb., $29.00 to $30.00; 20-lb., $27.50 to $28.00; 25 to 45-lb., $26.00; angle bars for standard sections, 1.35c; spikes, 1.75c to 1.85c.

Plates.—Nothing definite can yet be said regarding the prospective advance in plates other than it is not likely to be made this week, and if recent demand continues, it is pretty certain to be made this month. Demand keeps up and for any early delivery orders must go East, where there are some mills which can make better deliveries than the large local mills, which are about filled up with specifications for this year. We quote regular mill prices unchanged as follows:

Tank plates, ¼ in. thick, 6¼ in. to 100 in., 1.60c f. o. b. mill Pittsburg. Extras are as follows per 100 lb.: Flange and boiler steel, 10c; marine, A. B. M. A. and ordinary fire box, 20c; still bottom, 30c; locomotive fire box, 50c; plates over 100 in. up to 110 in. in width not less than 5c extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, 10c extra; gauges 7 and 8, 15c extra; No. 9, 25c extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific coast.

Merchant Bars.—No meeting of the steel bar mills has been called, but the expectation still is that there will be an advance this month. Tonnage is coming in very freely, as are specifications, and it is difficult to keep consumers supplied. Iron bars are in good demand and the market is very firm at the advance recently made. We quote:

Common iron bars, 1.70c, Youngstown; 1.75c, Pittsburg; hoops, 1.75c, and bands, 1.50c; taking hoop and band extras, respectively. Bessemer steel bars, 1.50c; open-hearth steel bars, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees under 3 in., 1.60, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Structural Material.—Even right here in the Pittsburg district one can see many places where foundation work has been completed on projects requiring structural steel and work has been suspended. These foundations at various points are mute testimonials to the difficulty in getting deliveries. Where shapes are being used it is because specifications were entered months ago. The local mills are filled with specifications into next year, and there are no stocks of moment either at mills or at dealers' yards. Angles even for extended delivery are bringing premiums right along, while on other shapes for immediate shipment almost any price can be secured that the buyer can afford to pay. We quote regular mill prices unchanged as follows:

Beams and channels 15 in. and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles, from 3 to 8 in. inclusive, 1.70c; universal and sheared plate, 6¼ in. and wider, 1.60c, base.

Sheets.—The market is still firmer, all concessions being withdrawn. A large tonnage is being booked. The independent mills are fairly well filled, as a whole, some of them being out of the market, while the leading interest is booking a larger tonnage and is operating the great bulk of its mills. On carloads with desirable specifications, for mill shipment, we quote No. 28 at 2.25c to 2.30c for black and 3.30c to 3.35c for galvanized. On very large lots the extreme concession is $1.00 per ton from the lower of the prices just named. We quote the official prices as follows, these being quite nominal but well representing the differentials between gauges:

No. 30, 2.65c; No. 29, 2.55c; No. 28, 2.40c; No. 27, 2.30c; Nos. 25-26, 2.25c; Nos. 22-24, 2.20c; Nos. 17-21, 2.15c; Nos. 15-16, 2.10c; Nos. 13-14, 2.05c; Nos. 10-12, 2c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; Nos. 27, 3.25c; No. 28, 3.45c; No. 29, 3.70c; No. 30, 3.95c. Quotations f. o. b. Pittsburg, 30 days net, 2 percent off cash 10 days.

Tin Plates.—On Monday, Oct. 2, a new price system is understood to have been adopted by the leading interest. On Aug. 5 a special rebate system had been put into operation, good for 60 days, by which in addition to the regular 5-cent rebate, with semi-annual settlements, a special rebate of 15 cents a box was made, payable within 10 days from time of payment of the invoice, making the net price $3.35 for 100-lb. cokes, f. o. b. Pittsburg, less the discount of 2 percent for cash in 10 days. In extreme cases some concessions have been made beyond this net price, and the new system, while leaving the "official" price at $3.55, makes an invoice price of $3.30, with a 5-cent rebate. The new price is, if anything, a slight reduction, although the market seemed to be improving somewhat. Some of the independents are not running as well as they were. The leading interest is operating 51½ percent of its tin plate capacity and week after next will start 10 mills of the 25-mill Monessen plant, which will give it about 56 percent.

Wire and Wire Nails.—The market is in good shape, tonnage being fairly large and being booked at the lately established prices, as follows:

Wire nails, jobbers' carload lots, $1.75; retailers' carload lots, $1.80, and less than carloads, $1.90; painted barb wire, $1.90 for jobbers in carloads; retailers' carloads, $1.95, and less than carloads, $2.05, with 30c for galvanizing. Annealed smooth fence wire is held at $1.60, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in 10 days. Iron and steel cut nails, $1.70 to $1.75.

Merchant Steel.—There is no change in the market, demand remaining fairly good. We continue to quote prices as follows:

Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.0c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.70c to 1.75c; toe calk, 2c to 2.05c.

Pipes and Tubes.—On Oct. 2 the National Tube Co. issued a new official list of prices, increasing discounts on steel pipe four points and on iron pipe 3½ points. The market had gotten entirely away from the official list, shading extending to easily four points and in some cases somewhat more. Of late the market has become stiffer, shading being not over four points, and this was seized as an opportune moment to bridge the gap between the official list and the actual market. The new list is regarded as fully representing the present market as lately strengthened. Several independent mills have lately been turning away business, being well filled up for the present. Boiler tubes are unchanged. The new discounts on merchant pipe, which represent a straight reduction of 4 points on steel and 3½ points on iron from the old official list, follow:

	Steel		Iron	
Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	71	55	68½	52½
⅜ and ½ inch	75	63	72½	60½
¾ to 6 inches	79	69	77	67
7 to 12 inches	74	59	72	56½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	64	52	61½	49½
½ to 4 inches	71	59	68½	56½
4½ to 8 inches	67	55	64½	52½
Double extra strong plain ends, ½ to 8 inches	60	49	58	47

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel	Iron
1 to 1¼ inches	44	41
1¾ to 2¼ inches	56	41
2½ inches	58	46
2¾ to 5 inches	64	53
6 to 13 inches	56	41

Less than carloads, two points less.

Old Material.—The market is very firm all along the line, although there is not a great deal of buying by consumers. Dealers are holding scrap where necessary for the winter, when they expect to be able to dispose of all accumulations without difficulty. Some, however, look forward selling as early in the winter as possible, fearing the possible shortage is being more than discounted. We quote prices unchanged:

Heavy melting stock, $15.75 to $16.00; low phosphorus scrap, $19.50 to $20.50; rerolling rails, $16.00; cast scrap, $14.75 to $15.25; borings, $9.50 to $10.00; No. 1 wrought, $17.00 to $17.50.

Coke.—The coke market continues excited and very firm. There has been a great deal of contracting by furnaces, taking strictly Connellsville furnace coke for next year at steadily advancing prices, from a shade above $2.00 a ton at ovens to about $2.50. On contract the market is now quoted $2.50 to $2.60, and it is stated that the higher price has been offered and turned down for some especially favorite brands. Prompt coke is very firm, and we note sales of round tonnages for both prompt delivery and fourth quarter at $2.50 and $2.60. Foundry coke is equally firm, and $3.00 is the regular quotation on strictly Connellsville 72-hour foundry coke, with this price being shaded 10 to 15 cents. Outside grades of coke are obtainable as usual at lower figures, but they are at less discount than was the case when coke was plentiful. There is no car famine, cars being obtained, however, with some difficulty, and there is some trouble from delays in transit. Production in the upper and lower Connellsville regions for the week ended Sept. 23 is estimated at 355,000 tons, while shipments are estimated at 13,000 cars.

LATE PITTSBURG NEWS.

(Special Telegram.)

Pittsburg, Pa., Oct. 4.—The Girard, O., mill of the Carnegie Steel Co. is now completely razed. Some of the machinery is being set up at Clairton.

The directors of the New Pittsburg & Lake Erie Ship Canal Co., Oct. 13 and 14, will make an inspection tour, using the Lake Erie to Youngstown and the Lake Shore to Erie. Plans of the right of way were inspected at a meeting held yesterday. The sum of $600,000, which has been raised for preliminary work, is regarded as amply sufficient.

A secret meeting was held last night at Braddock to organize a branch of the Industrial Workers of the World, which is put forth as allied to the Socialist-Labor party but which some regard as a labor organization. Sixty men are said to have signed as charter members. Other work has been done in the Monongahela valley, and it is said that efforts have been made at the Jones & Laughlin plant.

Official denial is made of the report that the American Sheet & Tin Plate Co. is to buy the plant of the Whitaker Glessner Co., Wheeling.

The report is current that the New York Central system is considering the purchase of 30,000 new cars, the order to be placed within a month.

Corrigan, McKinney & Co. have bought the town of Bells Mills, near Punxsutawney, and 100 acres besides to establish a blast furnace which they have contemplated for some time. The land lies just north of the Indiana county coal fields, where the firm owns 6,000 acres of coal land and is close to the Buffalo, Rochester & Pittsburg and Indiana branch of the Pennsylvania. This land was optioned recently, and a few more pieces are to be taken when the erection will be started of one large blast furnace.

The first formal meeting of the new officials of the Amalgamated Association was held yesterday. The new vice presidents, representing puddling, finishing, sheet and tin departments, were included.

Lake Superior Mining Institute.

The following is a general outline of the program for the Menominee range meeting, Oct. 17-19, subject to change by the committee in charge:

Tuesday. To visit the Chapin and Pewabic mines in the forenoon, leaving about noon for Crystal Falls, where the mines will be visited during the afternoon. The evening meeting will be held at Crystal Falls.

Wednesday. Visiting mines and points of interest around Sturgeon Falls and Vulcan. Evening meeting will be held in court house at Iron Mountain.

Thursday. Excursion to Escanaba, to visit various points of interest, after which a boat trip to Gladstone to visit the Cleveland-Cliffs furnace is planned.

In order to enable the committee to arrange ample accommodations for all, it is necessary that they be advised as early as possible of the number who will attend. Further information as to rates from the various points will be furnished to members as soon as possible, also list of papers to be read at the meetings.

The meeting promises to be one of the most interesting yet held, as the entire time will be devoted to the inspection of the iron industry.

The Western Foundry Co., Chicago, is preparing plans for a new foundry building 115 by 250, a cleaning building 60 by 272, and a core room 60 by 75. The necessary machinery has not yet been purchased. Bonds to the amount of $40,000 will be issued to cover the cost of the improvements.

CHICAGO.

Demand Continues Heavy but Without Wild Buying of Last Few Weeks.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, October 4.

After several weeks of unprecedented activity, the iron and steel market shows signs of settling down. The demand has not appreciably subsided, but it is noticeable there is not the excitement or wild buying that characterized the market a few weeks ago. Consumers have generally covered requirements for the first quarter of next year, and in some products for the first half, and are now content to let the market alone. The reassurances of sellers that there will be plenty of metal to fill all possible needs, especially of pig iron, have had much to do with steadying the market and allaying the skepticism of buyers. The only change in prices that went into effect last week was the advance of $1 a ton in wire products.

Both Northern and Southern furnaces are holding strictly to the prices that went into effect last week, and none are seeking actively for new business. Bar iron is exceptionally strong and has advanced $1 a ton, being now offered at 1.75c Chicago by local mills. Contracts for an aggregate of 30,000 tons of plates were closed with lake shipbuilding interests last week, and a total of 50,000 tons of rails was also taken in the same period from Western railroads. Sheets and merchant pipe are slow to strengthen, and in view of the high prices of raw material, some fear is expressed that there will be considerable defaulted tonnage by independent mills as a result of the large volume of business taken at the low prices which have prevailed during the summer. Structural steel is very scarce and six months' time is required by some sellers for the delivery of new business. An active demand was felt last week for coke, and for standard foundry grades the market is strong at $2.75 ovens. New levels in scrap values have been reached, but the upward movement continues.

Pig Iron.—Pig iron grows in strength daily. It is difficult to get iron for this year's delivery, except the lower grades, either from Southern or Northern furnaces, and for such as is offered premiums are frequently asked. One Southern interest has put its prices flat on the basis of $13.50 Birmingham for No. 2 foundry, while a number of others are asking $13. These doubtless represent extreme views of market conditions, but it is nevertheless a fact that very little iron can be obtained at $12.50. The leading producers below the Ohio river show no disposition to re-enter the market, and having little or no tonnage to offer for this year's delivery, are content to let the market drift knowing that it can drift but one way, and that upward. The demand for iron last week was very heavy, and fell principally on local and Western furnaces. Northern irons are very strong, and with the valley product practically shut out of this market another advance of 50 cents a ton is expected to take effect shortly. Lake Superior charcoal was put up 50 cents yesterday, and is now selling at $18 Chicago. Jackson County silveries have also advanced 50 cents a ton for this year's delivery, and $1 a ton for 1906 shipments. Several large contracts for malleable Bessemer were placed last week, and this product is strong at $17. We have revised our prices, and quote as follows:

Lake Superior charcoal	$ 18.00
Northern Foundry No. 1	18.00
Northern Foundry No. 2	17.50
Northern Foundry No. 3	17.00
Northern Scotch Foundry	18.00
Ohio Strong Softeners No. 1	17.30 to 17.80
Ohio Strong Softeners No. 2	16.80 to 17.30

Southern Foundry No. 1	16.65 to 17.15
Southern Foundry No. 2	16.15 to 16.65
Southern Foundry No. 3	15.65 to 17.15
Southern Foundry No. 4	15.40 to 15.90
Southern No. 1 Soft	16.65 to 17.15
Southern No. 2 Soft	16.15 to 16.65
Southern Gray Forge	14.65 to 14.90
Southern Mottled	14.40 to 14.65
Southern Silveries (4 percent to 6 percent Silicon)	17.65 to 18.15
Jackson Co. Silveries (8 percent to 10 percent Silicon)	19.80 to 20.80
Alabama and Georgia Car Wheel	20.65
Malleable Bessemer	17.00
Basic Iron	16.65 to 17.15

Billets.—Forging billets continue to be offered in this market at from $32 to $35 Chicago, according to the delivery required and the tonnage demanded.

Bars.—Demand for both iron and steel bars is very strong. One local maker of iron has advanced his prices $2 a ton, and is now asking 1.80c. Other sellers, however, have advanced their prices only $1 a ton, and on carload lots are asking 1.75c Chicago. Very desirable business can doubtless be placed at 1.70c, but this is by no means general. All quotations on steel bars were withdrawn by mills in anticipation of an advance of $2 a ton being announced after the pool meeting in Pittsburg. Orders continue to flow in with unparalleled freedom, making it utterly impossible to keep pace with the consumption. We quote, with the above reservation on soft steel bars and bands, carload lots, Chicago delivery, 1.66½c, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 1.91½c base, full extras. Hard steel angles, 1.60c to 1.65c. Demand from store is heavy and prices are firm. We quote bar iron, 1.95c to 2c base, full extras; soft steel bars and bands, 1.85c base, half extras; soft steel angles, channels and tees, under 3 in., 1.95c; hoops, 2.20c to 2.30c base, full extras.

Sheets.—Inquiry was very general last week and a good tonnage was closed up. The market is slow to strengthen, and it is still possible to buy black sheets on the basis of 2.20c Pittsburg for No. 28 gauge, and galvanized proportionately. Some independent mills have withdrawn entirely from the market, because of the rising cost of raw material. We quote carload lots, mill shipments, Chicago delivery, as follows: Blue annealed sheets, Nos. 9 and 10, 1.81½c; Nos. 11 and 12, 1.86c½c; Nos. 13 and 14, 1.91½c; Nos. 15 and 16, 2.01½c. On box annealed, one pass, cold rolled, we quote: Nos. 18 and 20, 2:21½c; Nos. 22 and 24, 2.26½c; Nos. 25 and 26, 2.31½c; No. 27, 2.36½c; No. 28, 2.46½c; No. 29, 2.56½c. We quote on lots from warehouse stocks, as follows: No. 10, 2.15c to 2.20c; No. 12, 2.20c to 2.25c; No. 14, 2.25c to 2.30c; No. 16, 2.35c to 2.40c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.60c to 2.70c; No. 27, 2.75c to 2.80c; No. 28, 2.85c to 2.90c; No. 29, 3c to 3.05c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.41½c; No. 16, 2.56½c; Nos. 18 and 20, 2.71½c; Nos. 22 and 24, 2.86½c; No. 26, 3.06½c; No. 27, 3.26½c; No. 28, 3.46½c; No. 29, 3.71½c. Jobbers' prices on small lots from store are as follows: Nos. 10 to 14 inclusive, 3.10c; No. 16, 3c; Nos. 18 and 20, 3.10c; Nos. 22 and 24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—The difficulty of getting deliveries from mills is becoming a matter of much concern to local jobbers and contractors. Structural steel of all forms and sizes is very scarce in Chicago, and no delivery short of six months can be promised on new business. Local stocks are kept replenished only by buying odd lots wherever possible and paying premiums for the immediate shipment of same. Prices are very firm. We quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in., inclusive, 1.86½c; angles, 3 to 6 in., ¼ in. and heavier, 1.86½c; angles larger than 6 in. on one or both legs, 1.96½c; beams larger than 15 in., 1.96½c; zees, 3 in. and over, 1.86½c; tees, 3 in. and over, 1.91½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote prices from store as follows: Angles, 2.25c to 2.35c; beams and channels, base sizes, 2.25c to 2.75c; tees and zees, 2.30c to 2.35c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—The transaction of chief interest was the contract taken by the local company for 30,000 tons of plates from the American Shipbuilding Co. Aside from this, the week's tonnage was made up of the usual large volume of small business. Mills withdrew all quotations in anticipation of an advance of $2 a ton being announced at the Pittsburg conference. With this reservation, we quote carload lots, Chicago delivery as follows: Tank steel, ¼ in. and heavier, up to 100 in. wide, 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Jobbers report a good movement from local stocks with store prices firm. We quote on small lots as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c to 2.10c; over 72 in. wide up to 100 in., 2.10c to 2.20c; over 100 in. wide, usual mill extras, 3-16 in. up to be not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—New business in standard sections last week aggregated 50,000 tons. An equal amount was declined by the South Chicago mill because of its inability to give the delivery desired. Light rails are very firm, and are being bought heavily by logging and electrical railroads. The demand for track supplies is limited only to the capacity of mills. We quote: Heavy sections in 500-ton lots, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $29; 16-lb., $28; 20-lb.,$27; 25-lb., $26; 30, 35, 40 and 45-lb. sections $25, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: Angle bars, 1.50c to 1.75c, according to tonnage; spikes, first quality, 1.80c to 1.85c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—There is nothing new to report. Demand is of excessive proportions and prices are extremely firm. With the expected advance in steel bars, it was figured that the products listed below would also be moved up. We quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21½c; railway spring, 1.86½c. Cold rolled shafting, 52½ percent off to dealers, 50 percent off in carload lots, and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up.

Cast Iron Pipe.—Two municipal contracts were closed last week, one from Newark, O., for 4,700 tons, and one from Chicago for 700 tons. Both went to the leading producer. Prices have been advanced 50 cents a ton. We quote carload lots, f. o. b. Chicago, 4-in. water pipe, $30; 6, 8, 10 and 12-in., $29; larger sizes, $28.50; gas pipe $1 extra.

Merchant Pipe.—By the withdrawal of some independent interests, local pipe prices have strengthened. They have not changed, however, and it is still possible to secure a discount of 80 to 81 percent on desirable business.

As the official prices have never been changed, we continue to quote these for the purpose of comparison:

MERCHANT PIPE.

	Steel. Black. Percent.	Steel. Galv. Percent.	Iron. Black. Percent.	Iron. Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

PLUGGED AND REAMED.

	Steel.		Iron.	
1 to 4 inches	71.35	61.35	69.85	59.85

EXTRA STRONG PIPE.

⅛ to ¼ inches	58.85	46.85	56.85	44.85
⅜ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85

DOUBLE EXTRA STRONG PIPE.

⅛ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—The local market is easier than it has been for several weeks. The lull is attributed to the fact that buyers have generally covered for this year's requirements. Prices are very firm. We quote carload lots, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	40.35	37.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	
		Up to 4½ inches	$0.50
6 to 13 inches	52.35	37.35	

Less than carload lots from store, as follows:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¾ to 5 inches, inclusive	60	47½	42½

Wire Products.—An advance of $1 a ton was made in wire nails and other wire products last week by the leading interest and independents. This action re-establishes the old basis in effect last summer, viz., wire nails at 1.85c Pittsburg. We have revised our prices, and quote carload lots, mill shipments, as follows: Wire nails, $2; painted barb wire, $2.15; galvanized barb wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.10; galvanized staples, $2.40c.

Coke.—A good demand was felt for coke last week, and the minimum at which standard 72-hour Connellsville grades is offered is $2.75 ovens. Connellsville furnace coke ranges from $2.10 to $2.25 at the ovens. Wise County, W. Va., and other brands, range from $4.50 to $5.

Old Material.—No evidence of weakness is seen in scrap. On the contrary prices reach higher levels each week. All the material that is offered by railroads and country dealers is taken up as quickly as offered, and good prices are paid for same. Two lists are on the market this week; the C. & N. W. for 1,100 tons, and the Chicago Junction for 400 tons. No. 1 railroad wrought has advanced 25 cents a ton; dealers' forge, busheling, and boiler punchings has each advanced 50 cents. We have revised our prices, and quote gross tons as follows:

Old steel rails (4 feet and over)	$15.50 to 16.00
Old steel rails (less than 4 feet)	15.00 to 15.50
Old iron rails	21.00 to 22.00
Relaying rails, subject to inspection	26.00 to 27.00
Heavy melting steel	15.00 to 15.50
Mixed country steel	12.50 to 13.00

We quote as follows net tons:

No. 1 R. R. wrought	17.00 to 17.50
No. 2 R. R. wrought	16.00 to 16.50
Shafting	17.50 to 18.00
Dealers' forge, No. 1	13.50 to 14.00
Wrought pipe and flues	11.50 to 12.00
No. 1 cast, 150 lb. and less	13.50 to 14.00
No. 1 mill	9.00 to 9.50
No. 1 Busheling	12.00 to 12.50
No. 2 Busheling	11.50 to 12.00
Country sheet	8.00 to 8.50
No. 1 boilers, cut	11.50 to 12.00
Boiler punchings	14.00 to 14.50
Iron car axles	23.50 to 24.00
Steel car axles	18.00 to 18.50
Iron axle turnings	11.00 to 11.50
Cast borings	9.00 to 9.50
Mixed borings, etc	9.00 to 9.50
Machine shop turnings	11.00 to 11.55
Railroad malleable	13.75 to 14.25
Agricultural malleable	13.25 to 13.75
Stove plate and light cast scrap	11.25 to 11.70
Old iron splice bars	18.00 to 18.50

PHILADELPHIA.

Orders of Moderate Size Come from Many Sources—Pig Iron Advances.

October 4.

Such is the demand for pig iron that some producers, when asked to give quotations for the remainder of 1905, answer with figures that are simply intended to be prohibitive, so high are they. As far as possible they also decline to commit themselves on orders for 1906. This position has been forced upon them by the great rush of buyers, who, fearful of a material advance during the next six months, are, naturally enough, seeking to protect their own interests. The result is a steadily rising market, which promises considerably higher prices. The most impressive thing about the orders pouring in, furnacemen say, is not their size, but their great number, and the fact that they seem to come from practically every branch of industry requiring pig iron. They reflect a remarkable degree of business activity and show the solid foundation upon which the iron and steel trade now rests.

Pig Iron.—Nearly all grades of iron have shown an advance in price during the past week. Some of the figures asked reveal a wide range and do not indicate real sales, such as $18.25 for No. 1 foundry, demanded by a producer whose order book is filled to the full capacity of his furnaces. Basic iron, which was dull through the summer, has shown much activity, and dealers who have sold all their output are quoting $16.75 to $17 to buyers. These are outside figures, but there is little doubt that in a short time they will look moderate. The inevitable consequence of this rush to buy, as was noted last week, is the blowing in of every antiquated stack that can produce pig iron, and there are a large number of these still left in the East. Among others that expect to get into operation this month are the Muirkirk (Md.) and Liberty (Va.) furnaces, small charcoal affairs that have had checkered careers. There can be little doubt that the competition of these numerous old and small furnaces will have a deterrent effect on the market if it shows a strong tendency to soar too high. Prices, in which sudden fluctuations may now be expected, may be quoted about as follows:

No. 1X Foundry	$17.50 to 17.75
No. 2X Foundry	17.00 to 17.50
No. 2 Plain	16.50 to 17.00
Standard Gray Forge	15.25 to 15.50
Ordinary Gray Forge	14.75 to 15.00
Basic	16.25 to 16.75
Low Phosphorus	21.00 to 21.50
Southern No. 2X, rail	16.00 to 16.25
Southern No. 2X, dock	15.50 to 15.75

Finished Material.—Activity is so general in nearly every line that there is little change to be noted. Skelp, which has been slow, is reported to be in better demand. In plates and structural materials it is the old story of premiums for anything like reasonable delivery. In beams, channels and angles, where 2c is given as the nominal outside range, buyers are actually paying as high as 2.6c, and perhaps more. Quotations, which in some cases are only nominal, remain unchanged as follows: Beams, channels and angles, according to specifications, 1.83½c to 2.50c; refined iron bars, 1.63½c to 1.80c; steel bars, 1.63½c to 1.83c; plates, 1.73½c to 1.80c.

Old Material.—Buyers have shown a little more disposition to meet the prices of dealers, but are still holding

off from buying freely. Prices in the meantime are advancing with the rest of the iron and steel trade, and speculators are picking up all the scrap they can find in the belief that quotations are to go still higher. For the present they may be given as follows, the range in some cases being naturally wide:

Old steel rails	$16.50 to 17.50
No. 1 steel scrap	16.00 to 17.00
Old steel axles	21.00 to 21.50
Old iron axles	25.00 to 26.00
Old iron rails	21.00 to 21.50
Old car wheels	16.00 to 16.50
Choice scrap, R. R. No. 1 wrought	20.50 to 23.00
No. 1 yard scrap	18.50 to 19.00
Machinery scrap	15.25 to 15.75
Low phosphorus scrap	20.50 to 21.00
Wrought iron pipe	15.75 to 16.25
No. 1 forge fire scrap	15.00 to 15.50
No. 2 forge fire scrap, ordinary	12.50 to 13.00
Wrought turnings	13.75 to 14.25
Axle turnings, heavy	14.75 to 15.25
Cast borings	9.50 to 10.00
Stove plates	12.50 to 13.00

NEW YORK.

Inquiry for Foundry Iron Urgent—Continued Activity in Steel Shapes.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., October 4.

Pig Iron.—Although the shrinkage of the supply by reason of the withdrawal from the market of a number of the large producers has reduced the volume of transactions in pig iron during the week, business has been very brisk, the last few days contributing their share toward making a record month. Heavy sales have continued covering deliveries mainly for this year with some tonnages running into 1906. Large transactions in basic are reported, but in the local market business has been mostly in foundry grades. Probably between 40,000 and 50,000 tons have been placed in New York during the week. Nearly every class of buyer has been in the market, including custom foundries, pipe works, stove manufacturers, makers of railroad equipment, and pump and machinery manufacturers. Prices have stiffened materially and there seems to be nothing to prevent their going considerably higher. Virginia iron has been sold at $15, furnace, and Eastern Pennsylvania furnaces are demanding $16.50 for No. 2 X. New York state producers have advanced to $16 at the furnace. Several of the local agents have been unable to consider offers for pig iron at all during the week owing to the retirement of their furnaces from the market. Those who are fortunate enough to have coke producers on their lists turned their attention to this product, which has been in great demand. Coke prices are very firm and some large tonnages are reported to have been placed. The following are prices at tidewater:

Northern No. 1 Foundry	$17.00 to 17.50
No. 2 Foundry	16.75 to 17.25
No. 2 Plain	16.00 to 16.50
No. 1 Southern Foundry	16.75
No. 2 Southern Foundry	15.75 to 16.25
No. 3 Southern Foundry	15.25 to 15.75
No. 4 Foundry	14.75 to 15.50

Pig Iron Certificates.—Trade in certificates has been more active during the week and a strong tone and higher prices prevailed. The tendency is still upward. On Saturday and Monday the market was dull but strong. Foundry iron warrants follow:

	Bid.	Asked.
October	16.00	16.10
November	16.00	16.15
December	16.00	16.20
February	16.15	16.30
March	.....	16.30

Finished Iron and Steel:—Excitement in the steel market has given place to confidence and strength. Large tonnages for structural material have been deferred from September to October. A number of contracts for railroad construction mentioned last week are still pending and business in the erection of steel buildings in the large cities is for the moment very quiet. The demand for heavy rails has been less active, the largest requirements evidently having been already met. Structural steel is still in urgent demand and premiums for early delivery continue. The American Bridge Co. reports sales for September, 30,000 tons. Its sales for the year to date are twice those of last year. Inquiry is very heavy and the company expects those orders will insure plants running up to full capacity throughout the next year. The plants at Canton, O., and Athens, Pa., are in operation and will soon reach full capacity, if material can be obtained.

Independent plate mills are finding a satisfactory demand, but they are still in position to accept new business. Sheets and wrought pipe have as yet not felt the effect of the prosperity prevailing in other lines. The greatest interest of the week centered about the activity in billets, several lots of which were reported sold at advanced prices. The following are prices at tidewater: Angles, 3 to 6 in. x ¼ in. and heavier, 1.84½c; beams, 3 to 15 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary fire box, 1.94½c; refined iron bars, 1.60c; soft steel bars, 1.64½c to 1.79c; sheets in carload lots, New York, No. 28, black, 2.40c.

Old Material.—The demand for all kinds of scrap material is improving and prices are strong all along the line. The position of heavy melting steel scrap has strengthened especially. Wrought material is in good demand and cast scrap is apparently feeling the effect of the very strong market for pig iron. The following prices are f. o. b. approximately, at tidewater:

Old iron rails	$20.00 to 21.00
Old steel rails, long lengths	14.50 to 15.00
Old steel rails, short pieces	14.00 to 14.50
Relaying rails	22.50 to 23.00
Old car wheels	16.00 to 16.50
Old iron car axles	21.00 to 22.00
Old steel car axles	18.50 to 19.00
Heavy melting steel scrap	14.00 to 14.50
No. 1 railroad wrought scrap	18.00 to 19.00
Iron track scrap	17.00 to 17.50
Wrought pipe	12.00 to 13.00
Cast borings	9.50 to 10.00
Wrought turnings	13.50 to 14.00

CINCINNATI.

Sales of Pig Iron not Heavy, but Market Firm with Upward Tendency.

October 4

Pig Iron.—The business of the week has been of fairly good proportions, although there were but few large orders placed. The buying has been mainly for lots ranging from 100 tons to 500 tons, and comparatively few sales over 1,000 tons. Much of the business consisted of winding up orders that were pending in the preceding week. There has been enough iron sold at $12.50 Birmingham to establish that figure as a quotation, although some business was recently booked at $12 to $12.25, Birmingham basis. A large part of the buying is for delivery in the first quarter of 1906, and some sales extend into the second quarter of the year. Some of the large furnace interests are declining to make quotations beyond the first quarter, and in some cases $13 Birmingham is being quoted for second quarter delivery. There has been a good inquiry for special irons, such as car wheel and silvery, and some filling in orders of extra strong irons. In Northern irons Southern Ohio furnaces have advanced their quotations, and $15 for No. 2 foundry at furnace now appears to be the minimum. Consumers are calling for deliveries, but the movement of iron is not as satisfactory as could be desired, and transportation difficulties are apprehended.

The market is generally regarded as strong with an advancing tendency, and some furnace interests have withdrawn entirely from the market under the belief that higher prices than now maintained will be realized in the near future. The amount of business done in pig iron for delivery over the last quarter of the year was somewhat unexpected, as sales agencies were inclined to believe that consumers had practically covered their wants for this year. It is believed, however, that consumption has been heavier than buyers counted on when they placed their July orders. The market appears to be in strong position under the evidences of heavy consumption and the approach of the winter season, which will serve as a check to increased production. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$15.25 to 15.75
Southern Foundry No. 2	14.75 to 15.25
Southern Foundry No. 3	14.25 to 14.75
Southern Foundry No. 4	13.75 to 14.00
Southern Foundry No. 1, soft	15.25 to 15.75
Southern Foundry No. 2, soft	14.75 to 15.25
Gray Forge	13.25 to 13.50
Northern Foundry No. 1	16.65 to 17.15
Northern Foundry No. 2	16.15 to 16.65
Northern Foundry No. 3	15.65 to 16.15
Jackson County Silvery, 8 percent	18.15 to 19.15
Southern Charcoal	18.75 to 19.25

Finished Material.—The market continues firm, and there is a continued good demand for the entire list. Deliveries on some lines are becoming increasingly difficult to obtain. An improved demand for sheets is reported. Bar iron is stronger and quotations are $1 per ton higher than a week ago. Bar iron is quoted at 1.70c to 1.75c; steel cars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.48c. We quote black sheets, No. 27, at 2.30c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 12 2c. Tank plates are firm and sell out of store at 2c for ¼-in. and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.50c from stock and angles at 2c to 2.05c for base sizes.

In merchant pipe the situation shows no change and prices continue somewhat irregular, but a fairly good demand is reported. We quote f. o. b. Cincinnati as follows:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black.	Steel Pipe. Galv.	Guaranteed Wrought Iron Pipe. Black.	Guaranteed Wrought Iron Pipe. Galv.
	Percent.	Percent.	Percent.	Percent.
⅛ and ¼ inches	65.35	49.35	63.35	47.35
⅜ and ½ inches	69.35	57.25	67.35	55.35
¾ to 6 inches	73.35	63.35	75.85	61.85
7 to 12 inches	68.35	53.35	66.85	51.35

Coke.—The demand is active and sales have been heavy during the week, with prices showing an advancing tendency. Prompt shipment coke is becoming difficult to obtain and deliveries on contracts are unsatisfactory, by reason of car shortage in the coke-producing districts. There are a number of inquiries in the market for deliveries extending well into next year. Some quotations are 25c per ton higher than a week ago, and we revise quotations in conformity with the higher prices prevailing. Prices in the various coke-producing districts are as follows f. o. b. ovens:

†Wise County, Va. Furnace Coke prompt shipment	$ 2.25 per ton
Wise County, Va. Foundry Coke on contracts	2.75 to 3.00 per ton
Pocahontas Furnace Coke on contracts	2.10 to 2.25 per ton
Pocahontas Foundry Coke on contracts	2.50 to 2.75 per ton
*Connellsville Furnace Coke on contracts	2.25 to 2.50 per ton
*Connellsville Foundry Coke on contracts	2.75 to 3.00 per ton
Kanawha Furnace Coke on contracts	2.10 per ton
Kanawha Foundry Coke on contracts	2.35 to 2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices.

*Connellsville Coke inside prices apply to "main line" ovens and not to strictly Connellsville Coke.

Old Material.—There is a good demand and trade is active with prices showing an advancing tendency. Some quotations rule higher than a week ago. We quote f. o. b. Cincinnati:

Old No. 1 railroad wrought, net tons	$16.00 to 16.50
Cast machine and foundry, net tons	13.00 to 13.50
Old iron rails, gross tons	21.00 to 22.00
Old steel rails, gross tons	15.00 to 16.00
Old short lengths, gross tons	14.00 to 15.00
Old iron axles, net tons	21.50 to 22.00
Stove plate, net tons	10.00 to 10.50
Wrought turnings, net tons	10.50 to 11.00
Cast borings, net tons	8.50 to 9.00
Car wheels, net tons	15.50 to 16.00

CLEVELAND.

Iron Ore Movement will be about 32,000,000 Tons—Discussion as to Prices.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, October 4.

Iron Ore.—Reports of ore shipments for September are not yet complete, but indications are that the movement will be about 4,600,000 tons. The shipments from Duluth, Two Harbors and Superior amounted to 2,912,595 tons; an increase of 324,287 compared with September, 1904. The total movement in September, last year, was 4,006,443 tons and for October, 4,034,721 tons. After Nov. 1, last year, there were 3,569,532 tons moved. Estimating the shipments for September of this year at 4,600,000 and those for October at the same and the shipments after Nov. 1 at 3,500,000, the shipments for the year 1905 would amount to 33,700,000. It is the general belief, however, that the movement after Nov. 1 will not be as heavy as it was last year, and that the total shipments will be about 32,000,000 tons. Heavy rains in the mining region continue to interfere with shipments and the dispatch at lower lake ports is not as fast on account of the railroads having urgent need for their cars for other purposes.

There has not yet been any formal discussion of ore prices for next year, but it is known that there is some difference of opinion among the producing companies, some favoring an advance of 25c per ton, while others advocate an advance of not less than 50c per ton. A conservative element points out the danger of the rapid increase in the price of raw material; saying, that if the prices of ore and coke advance as much as it is possible they may, pig iron prices will be forced to a high level, buying will be checked and prosperity will receive a severe jolt.

Pig Iron.—Buying of foundry iron is still to a large extent for this year's requirements, as furnaces are not disposed to sell at current prices for next year's delivery and the foundrymen are not willing, as a rule, to buy at a higher price than $15, valley. Some sales have, however, been made at Toledo and Buffalo at a higher rate, and we note a sale of 750 tons, Toledo, at $15.50, for delivery during December and the first two or three months of next year; while No. 2 X is being sold at Buffalo from $15.50 to $15.60. The tendency of coke to advance and the uncertainties as to the price of ore are factors in the situation. There is a good demand for basic; the usual quotation being $15.25, valley for this year's delivery. We quote as follows, Cleveland delivery:

Bessemer	$15.85 to 16.10
No. 1 Foundry	16.00 to 16.50
No. 2 Foundry	15.00 to 15.85
No. 3 Foundry	14.50 to 15.00
No. 2 Southern	15.85 to 16.10
Gray Forge	14.50 to 14.75
Gray Forge, Southern	14.25 to 14.50
Lake Superior charcoal	17.00 to 17.50

Finished Material.—There is a very strong demand, especially for structural material, on which it is very difficult to give satisfactory delivery. The demand for plates is

also strong, but fair delivery is now being given from mills at Coatesville and other places. The bar iron market is very strong at 1.70c at the mills and the Empire Rolling Mill Co., of Cleveland, has arranged to double its capacity, but the new capacity will not be available this year. There is improved demand for boiler tubes, as boiler manufacturers are almost without exception very busy. The cutting in prices of sheet continues.

Old Materials.—The demand for old materials continues strong and prices on a number of lines were advanced during the week, with the probability that the top figures have not yet been reached. Heavy tonnages are being stored in anticipation of higher prices. Inquiries are plentiful. We quote Cleveland delivery as follows:

Old iron rails	$22.50 to 23.50
Old steel rails (over 6 feet)	15.50 to 16.50
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	15.50 to 16.00
Steel boiler plate	13.50 to 14.50
Steel axles	18.00 to 19.00
Malleable iron (railroad)	15.50 to 16.50
Malleable iron (agricultural)	14.50 to 15.50
Heavy steel	16.50 to 16.75

We quote as follows, net tons:

No. 1 R. R. wrought	16.50 to 17.00
No. 1 busheling	14.00 to 15.00
No. 1 machine cast	13.75 to 14.25
Iron axles	22.00 to 23.00
Axle turnings	11.50 to 12.50
Wrought turnings (free from cast)	11.00 to 12.00
Grate bars	8.50 to 9.50
Pipes and flues	12.50 to 13.50
Tank iron	10.00 to 10.50
Hoop and band iron	8.00 to 9.00
Sheet iron	7.00 to 8.00
Wrought drillings	11.00 to 12.00
Stove plate	10.00 to 10.50
Cast borings	8.50 to 9.50

BIRMINGHAM.

Republic Rolling Mills will Resume—Pig Iron Prices Firm and Advancing.

Birmingham, Ala., October 2.—Alabama pig iron manufacturers are holding their iron firmly for strong prices and No 2 foundry is approaching a basis of $12.50 per ton, with a still better price in view. There is a good demand and some sales are being made for delivery into next year. Inquiries are frequent now for iron to be delivered during the first half of the coming year, but there is no general tendency to sell that far ahead. The production in this state is holding up very well, only one furnace in the past fortnight being blown out for repairs. No time will be lost in putting the furnace in shape to resume operations. The Tennessee Coal, Iron & Railroad Co. is working on the Alice furnace, in the city, looking to an early resumption. The raw material supply is becoming stronger. The bins at the furnaces all look well filled, and as far as can be learned, there is no apprehension that this winter will see much hardship in keeping the bins right up to the notch. Iron is being shipped from the district in great quantities. The railroad officials are giving the movement every attention. The accumulated stacks are showing the signs of steady shipment, there being no doubt of the fact that more iron is being moved out than is being manufactured.

The firm price has had no effect so far on the inquiry for iron and the refusal of manufacturers to scale prices some does not check the demand. The indications are that No. 2, foundry, iron will advance at least fifty cents per ton before the middle of the month; in fact several companies in this district do not care to force business. Considerable attention is being given to the production. On this point the Alabama furnacemen are very anxious to get the best possible results.

Iron quotations are as follows: No. 1. foundry, $13; No. 2, foundry. $12 to $12.50; No. 3, foundry, $12; No. 4, foundry, $11.50; gray forge, $10.50 to $11; No. 1, soft, $13; No. 2, soft, $12 to $12.50.

The production at the Ensley steel plant is holding up well. Joseph Durfee, formerly of Colorado, is now general superintendent of the plant for the Tennessee Coal, Iron & Railroad Company.

It is announced that the Republic Iron & Steel Co. will start up its big Birmingham rolling mills next Monday, the 9th inst. The plant has been out of commission for nearly a year.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1815, NO. 150 NASSAU ST., October 4.

Pig Tin.—Quiet has ruled the market during the week. Monthly statistics collected by Secretary C. Mayer, of the New York Metal Exchange, show a visible supply which is 1,350 tons larger than that of the corresponding period last year. Today's quotations follow: Spot, 32c to 32.50c; October, 32c to 32.40c; November, 31⅞c to 32⅜c; London, £147 15s and £146 12s 6d.

Copper.—A stronger undertone pervades the entire copper market, owing to an increasing scarcity of available supplies for spot and future deliveries. Today's closings follow: Lake and electrolytic, 16¼c to 16½c; casting, 16c to 16¼c. London's closing today: £71 12s 6d and £70 12s 6d. Exports for September, 17,780 tons.

Lead.—There was considerable activity last week and prices are firmly held at the old figures: 4.85c to 4.95c; St. Louis, 4.80c; London, £14 2s 6d.

Spelter.—The market for refined spelter continues firm. Today's closings follow: Spot, 5.95c to 6.05c; St. Louis, 5.77½c to 5.80c; London, £27 10s.

Antimony.—The market is weak and prices range lower. Today's quotations follow:. Cookson's, 13c to 13½c; Hallett's, 12¾c to 13¼c; other grades, 11½c to 12c.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, October 4.

Buying of metals continues of active proportions. Copper has advanced a quarter of a cent and pig tin an eighth cent. The market has a strong tone and all products are firm in price. We quote lake copper, 16¾c for carload lots, Chicago, and 17c for less than carload lots. Casting copper, 16½c for carload lots and 16¾c for lesser quantities. Spelter is unchanged at 5.85c for carload lots, and 6c for smaller lots. Sheet zinc is selling freely at 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig tin, 33⅛c for carload lots, and 33½c for less than carload lots. Pig lead, 4.85c for 50-ton lots, 4.90c for carload lots and 5c to 5⅛c for less than carload lots. Antimony is scarce at 16c for Hallett's, and 18c for Cookson's.

Old metals are slowly climbing upward in price. Demand is brisk and supplies low. Dealers' quotations are approximately as follows: Copper wire, 14½c; heavy copper, 14¼c; copper bottoms, 13c; copper clips, 14c. Red brass, 13½c; red brass borings, 11½c. Yellow brass, 9¾c; yellow brass borings, 9¼c. Pipe lead, 4c. Tea lead, 3.75c. Sheet zinc, 4c.

Warrant Yard Stocks.—Pig iron stocks in warrant yards have continued to decrease. The amounts on hand at the end of May, June, July, August and September were respectively 81,200, 88,900, 93,400, 86,800 and 77,200 tons, a net falling off for the five months of 4,000 tons. A larger delivery, 10,800 tons, was made this month than has been made in a period of six months.

The Ideal Stoker, 114 Liberty street, New York, has secured a contract for installing the stokers at the plant of the Para Recovery Co., Bayonne, N. J.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

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OCTOBER 5, 1905

REAL STATISTICS OR NONE.

On July 20, *The Iron Trade Review*, for the first time published statistics of production and stocks of the coke and anthracite furnaces of the United States. The publication of these statistics was preceded by a large amount of correspondence with 152 operating companies, many personal visits to owners of plants, and other work involving considerable expenditure of energy and money, but it was gladly undertaken in the belief that the complete presentation of these statistics in acordance with an arrangement to show production by states instead of by the old district system, would be satisfactory to all interested. The publication was heartily recommended by many; in fact, the compilation was so well done that an organization formed for statistical purposes, known as the Western Pig Iron Association, realized that, with a trade journal intelligently publishing this information, there was no longer reason for the existence of the association. Hence its secretary started to arouse opposition to the publication of the statistics by trade journals and the result of this agitation was to crystallize a sentiment, which had been forming for some time, against any publication of figures as to production and stocks except annually by the American Iron and Steel Association. One of the largest producers of pig iron in the country wrote us as follows:

> We have before us your request that this company should furnish you with the statistics of the production at our various blast furnaces and the stocks on hand for the past month.
>
> After giving this matter a great deal of consideration, we desire to say to you that we have for some years felt that the publication of these statistics at regular periods was something that was productive of no good to anyone, and has been, we believe, the cause of considerable injury to the pig iron producers of the United States. When your publication commenced to gather these figures, the matter was again considered by us, and out of compliment to *The Iron Trade Review* and in view of the fact that you appeared to be securing these statistics from other sources, we felt that it would be rather unjust to discriminate against you, and hence we decided to send them to you pending further consideration of the entire question. We have now gone over the whole proposition once more, and have decided that in the future we will not furnish any figures of the production at any of our furnaces, and trust that you will feel that we are taking this step only because of a desire to protect our own interests. We fail to see why a producer of pig iron should advertise the extent of his business or its condition, any more than he would give publicity to his bank account or the character of his trial balance. Assuming that the producers of pig iron are benefited,—and we feel sure that none can demonstrate that they are,—we are equally sure that the consumers have not reaped any advantage for the reason that the publication of these figures has occasionally led to the existence of a false impression for which the consumers have had to pay and pay dearly.
>
> Just as an illustration of this (and we could recite many others) let us suppose a correct statement of stocks on hand Sept. 30 should be furnished. The result would be very misleading to any one who might pay any attention to it for the reason that it would naturally show a large amount of iron on hand at furnaces while, as a matter of fact, there would be practically none of it unsold.

As we announced in our issue of Sept. 14, companies operating some 50 furnaces decided early in September not to give their statistics of production and stocks to any journal or any association except the American Iron and Steel Association, which, under the able management of Mr. James M. Swank, has published statistics of the manufacture of iron and steel for many years. During the past two weeks, other important furnace interests have taken similar action and it is now clearly apparent that a considerable number of furnace companies are opposed to the publication of the statisics and will not send in their reports. Hence it becomes impossible to publish complete statistics and rather than publish a statement which would be inaccurate and misleading, *The Iron Trade Review* has decided not to attempt hereafter to collect these statistics. In some quarters, thinly veiled threats have been made to send men to the plants of furnace companies failing to report and in that way get estimates of production and stocks by a sort of eavesdropping process, but, so far as *The Iron Trade Review* is concerned, no attempt to get clandestinely the reports which have been refused will be made. We have tried to serve the trade and the public generally by the compilation and publication of this information. As many manufacturers do not believe the publication is wise, we submit to their decision.

We shall not be a party to the publication of alleged statistics, which are in fact a fraud, a jumble of wild estimates.

A REASONABLE SETTLEMENT.

The recent settlement of the labor controversy in foundries at St. Paul, Minn., is of unusual interest and marks a distinct advance toward agreeing upon a form of compensation which recognizes that all men should not be on a dead level in the matter of wages.

In the spring of 1904 there was a general reduction of wages of molders in St. Paul to the minimum. The foundrymen found it necessary to reduce expenses, but were opposed to a reduction which treated all men alike, regardless of their earning power. The injustice of this action to skilled workmen was urged, but the employers were finally compelled to follow the policy dictated by the unions. Early in 1905, the molders and coremakers of St. Paul demanded an increase in the minimum wage rate. During the entire summer the foundrymen refused absolutely to grant a horizontal increase and urged the injustice of all employes receiving the same pay. Attention was also called to the fact that the minimum wage was an excess of what many of the poor workmen could possibly earn. The foundrymen urged that the best men should receive the highest pay, and that all men be paid according to their skill, ability and character. The national union officials made numerous visits to St. Paul in advocacy of a horizontal raise of the minimum. At a meeting of the St. Paul foundrymen with the officers of the National Molders' Union, the foundrymen made their employes two propositions. The first was to select a reasonable number of the high grade men whose wages were reduced heavily in 1904 and restore about 50 percent of the cut; to raise the coremakers the same but under no circumstances would they raise the pay of the men who were working at the minimum in 1904 whose wages were not reduced at that time as they ought to have been; the demand for the raise of the minimum to be withdrawn by the men. The second proposition was to arbitrate the entire wage question. The following day the molders notified the foundrymen that they had decided to accept the first proposition. A readjustment of wages has taken place, and the molders and coremakers are now working with the old minimum wage rate for the men of minimum skill, while men of more earning power have received a partial restoration to make up for the reduction of 1904. As the wages now stand, the employes are graded according to their skill, there being several differentials.

By giving up the contention so long adhered to that all men should be paid the same wages, the union has made an important concession for which it deserves hearty commendation. As Mr. J. H. Webster recently said in an article in the *Open Shop*: "No intelligent workman will forever be content to put his superior power to earn the highest wages upon a par with his lazy, inefficient brother. Human nature is not so constituted and cannot be so trained even by a union." The unions, if they are to continue to exist, must recognize the fact that the man of superior ability is certain to assert his individuality and that he will not be content to remain in the union earning only the wages paid to the poorest of his fellow workmen.

THE AMERICAN FLOATING EXPOSITION.

No one manufacturing industry is so closely concerned in the profitable opening of new markets for our manufactured products as is the iron trade. With its concomitant interests, it is concerned in one way or another, directly or indirectly, in nearly every manufactured article we now export, and for the year 1904 the value of the exports of iron, exclusive of pig, aggregated $135,000,000, and in addition, iron constituted some part of the final value in almost every article exported.

It follows that any project for the extension of our export trade should have special interest for the iron and steel trade. The excellence of American manufacture in certain metal lines is internationally recognized—it should be our steadfast purpose as an industrial people to extend this recognition by fostering every practical project organized to bring our factories in closer touch with the great outside world where the demand lies.

The plans of the American Floating Exposition described elsewhere in this issue, seem to be designed to render this valuable service, and the opportunity appears to be one that is deserving of hearty support.

A VITAL PART OF THE STEEL TRADE.

There is at the present time an industrial revolution taking place on the great lakes that is of vital interest to every steel maker in the country. The revolution is in shipbuilding. One has but to look backward a year or two to appreciate how significant it really is. The year 1904 opened very inauspiciously on the great lakes for in the early spring the shipyards found themselves practically without a single order on their books. This condition was in wonderful contrast with the preceding year, 1903, when the shipyards had orders for sixty-two vessels valued at over $13,000,000. Of these sixty-two vessels, forty-eight were bulk freighters capable of carrying in a single trip 230,950 gross tons of ore. The summer of 1904 went by without anything special in sight for the shipyards, but towards fall orders began to come in rapidly and before winter set in every shipyard on the lakes had all that it could possibly do. Considering all classes, they had forty-seven ships to build, of which twenty-two were bulk freight carriers. It is a singular and significant thing that these twenty-two freight carriers had a carrying capacity on a single trip of 214,200 gross tons of ore against a carrying capacity of 230,950 tons for the forty-eight freighters built during the preceding year.

Thus we see that in practically one year the average carrying capacity of vessels under construction had nearly doubled. Owners were quick to see the change and those who had smaller vessels sent them to the shipyards to be lengthened. Seven such orders were placed. The United States Steel Corporation with 112 vessels on the lakes determined to modernize its fleet and to scrap its smaller vessels. To this end it disposed of sixteen of its smaller whalebacks and sent them to the coast, reducing its available fleet at the opening of the present season of navigation to ninety-six ships. It had previously given orders to the American Ship Building Co. for four steamers exceeding in dimensions anything afloat on the lakes. These four steamers are now in commission.

This would seem to be a prodigality of orders such as to satisfy the most ravenous shipbuilders. But the end is by no means yet. Since spring, orders have been placed with lake shipyards for twenty-four vessels for 1906 delivery, of which the American Ship Building Co., of Cleveland will build nineteen, the Great Lakes Engineering Works of Detroit four and the Craig Ship Building Co., of Toledo one. This state of affairs is unprecedented in the history of lake shipbuilding. As a rule orders have never been placed for next year's delivery until late in the fall when conditions that are likely to obtain during the succeeding year may be viewed at closer range. Of these twenty-four steamers, with the single exception of one steamer of 6,500 tons, all are of the larger class, four of them capable of carrying 8,000 tons, three 9,000 tons, two 9,500 tons, twelve 10,000 tons and two 12,000 tons. When there is added to this fleet the twenty-one ships that were under order at the beginning of the present year, having a carrying capacity of from 8,000 to 10,000 tons each, it will be found that the forty-five ships which have been constructed or which have been ordered since the beginning of the present year have a carrying capacity on a single trip of 421,500 gross tons of ore or in an average season of twenty trips, 8,430,000 tons of ore. This is more ore than was moved on the great lakes in any one year up to 1896, with the exception of the years 1890, 1892 and 1895, when the movement was a little in excess of it, but it was not until 1896, only nine years ago, that this movement was permanently passed.

VESSELS UNDER CONSTRUCTION IN GREAT LAKES YARDS.

Name	Over all Length Feet	Keel Feet	Beam Feet	Depth Feet	Year Built	Capacity Gross Tons	Owner
Ball Bros.	500	480	52	30	1905	8,000	G. A. Tomlinson, Duluth
James C. Wallace	532	532	56	31	1905	10,000	Acme S. S. Co. "
S. M. Clement	500	480	52	30	1905	8,000	Mitchell & Co., Cleveland
Philip Minch	500	480	52	30	1905	8,000	H. Steinbrenner "
Amasa Stone	545	525	55	31	1905	10,000	Pickands, Mather & Co., Cleveland
L. C. Smith	545	525	55	31	1905	10,000	U. S. Trans. Co., Cleveland
Sylvania	524	504	54	30	1905	9,000	G. A. Tomlinson, Duluth
Socapa	524	504	54	30	1905	9,000	G. A. Tomlinson "
W. A. Rogers	545	525	55	31	1905	10,000	Niagara Trans. Co. "
L. C. Hanna	524	504	54	30	1905	9,000	M. A. Hanna & Co., Cleveland
P. Stackhouse	524	504	54	30	1905	9,000	M. A. Hanna & Co. "
Wm. A. Paine	500	480	52	30	1905	8,000	Hutchinson & Co. "
E. H. Gary	569	549	56	31	1905	10,000	Pittsburg S. S. Co. "
W. E. Corey	569	549	56	31	1905	10,000	Pittsburg S. S. Co. "
G. W. Perkins	569	549	56	31	1905	10,000	Pittsburg S. S. Co. "
H. C. Frick	569	549	56	31	1905	10,000	Pittsburg S. S. Co. "
J. E. Davidson	524	504	54	30	1905	9,000	G. A. Tomlinson, Duluth
Hoover & Mason	524	504	54	30	1905	9,000	G. A. Tomlinson "
W. G. Mather	531	511	60	31	1905	10,000	Cleveland Cliffs I. Co., Cleveland
Peter White	524	504	54	30	1905	9,000	Presque Isle Transp. Co. "
James P. Walsh	500	480	52	30	1905	8,000	C. O. Jenkins, Cleveland
John Stanton	524	504	54	30	1906	9,000	C. L. Hutchinson "
Unnamed	524	504	54	30	1906	9,000	Wilson Transit Line, Cleveland
"	545	525	55	31	1906	10,000	C. L. Hutchinson "
"	545	525	55	31	1906	10,000	John Mitchell "
"	545	525	55	31	1906	10,000	John Mitchell "
"	436	416	50	28	1906	6,500	John Mitchell "
"	534	514	54	31	1906	9,500	Gilchrist Trans. Co. "
"	534	514	54	31	1906	9,500	Gilchrist Trans. Co. "
"	500	480	52	30	1906	8,000	Hugh McMillan, Detroit
"	524	504	54	30	1906	9,000	E. D. Carter, Erie
"	500	480	52	30	1906	8,000	W. C. Richardson, Cleveland
"	550	530	56	31	1906	10,000	Jones & Laughlin, Pittsburg
"	550	530	56	31	1906	10,000	Jones & Laughlin "
"	550	530	56	31	1906	10,000	Globe S. S. Co., Duluth
"	550	530	56	31	1906	10,000	W. P. Snyder & Co., Pittsburg
"	505	485	56	31	1906	8,000	L. O. Sullivan, Toledo
"	545	525	55	31	1906	10,000	H. A. Hawgood, Cleveland
"	569	549	56	31	1906	10,000	U. S. Trans. Co. "
"	545	525	55	31	1906	10,000	Hawgood & Co. "
"	545	525	55	31	1906	10,000	Herbert H. Oake, Detroit
"	569	549	56	31	1906	10,000	M. M. Mills, Tonawanda, N. Y.
"	500	480	52	30	1906	8,000	C. O. Jenkins, Cleveland
"	600	580	58	32	1906	12,000	Pittsburg S. S. Co., Cleveland
"	600	580	58	32	1906	12,000	Pittsburg S. S. Co. "

Total in one trip, 421,500 gross tons of ore. Total in a season of twenty trips, 8,430,000 gross tons of ore.

Consider what these orders mean to the steel maker and to the general industry of the United States. In every one of these ships approximately 5,000 tons of steel will have been worked. No single order is of greater importance to industry in general than an order for a ship, since it distributes work so widely. A ship is a great consumer of material in various forms. These orders are valuable, too, as affording an index of the general state of prosperity throughout the country. The companies that have given these orders have unusual opportunities for forecasting future conditions and undoubtedly the orders would not have been placed had the outlook not warranted it. The movement of ore on the lakes during the present year will be the heaviest ever known, probably in excess of 31,000,000 tons, and an even greater movement is expected next year. As a matter of record there is appended herewith a table showing the vessels under construction in the great lakes yards since the beginning of the present year. Looking down the list it will be observed that the steamer John Stanton is credited for 1906 delivery, but the American Ship Building Co., was unusually expeditious in the construction of this vessel and launched her three weeks ago. It is expected that she will make two or three trips during the present year.

PERSONAL.

J. H. Plummer, president of the Dominion Iron & Steel Co., Montreal, has been granted a six months' leave of absence which he will spend abroad in search of health.

Milton W. Stambaugh, foreman of the stock yards of the Brier Hill Coal & Iron Co., Youngstown, O., has resigned.

Bertram J. Parker has been chosen secretary and treasurer of the Youngstown Foundry & Machine Co., Youngstown, O.

J. B. Emerson formerly employed as a chemist at a steel plant at Joliet, Ill., has accepted the position of chief chemist for the Mt. Vernon Car & Mfg. Co., Mt. Vernon, Ill.

John Allman, acting manager of the Standard Steel Car Co., Butler, Pa., has been appointed manager of that plant and is now in charge.

J. M. Jones, formerly with the American Sheet & Tin Plate Co., Pittsburg, is the new local manager of the Lalance & Grosjean Tin Plate Works, Harrisburg, Pa. He succeeds W. H. Shetron.

Among the foreign engineers now touring the United States are: Carl Wallmann and Alfred Drischner, of the firm of Thyssen Co., Mulheim, Ruhn, Germany, and F. W. Reed, of Manchester, England.

J. E. Hubbert, formerly of Hubbert & Hubbert, Chicago, iron and steel merchants, has accepted a position in the sales department at Chicago of the American Sheet & Tin Plate Co.

William E. Means, formerly with the Illinois Zinc Co., Peru, Ill., has gone into business for himself and is handling a line of metals on a commission basis. His office is at 1270 Old Colony building, Chicago.

Chas. C. McCutchen is the new general manager of the Premier Motor Mfg. Co., Indiana, having resigned a similar position with the American Roller Bearing Co., South Framingham, Mass. He will be succeeded by Fred B. Hill.

F. W. Bunts, who has represented in Chicago the Empire Iron & Steel Co., Niles, O., has given up that agency to become associated with the Jones & Laughlin Steel Co., at its Chicago office. C. E. Louis, 540 The Rookery, succeeds him.

President J. A. Campbell, of the Youngstown Sheet & Tube Co., is enjoying a vacation at Old Point Comfort. His company recently awarded to the William B. Pollock Co. a $50,000 contract for conveyors and converters for the new mill at East Youngstown.

R. R. Shuman, formerly Western editor of the *Iron Age*, has opened offices at 1270 Old Colony building, Chicago, for the carrying on of advertising business, making a specialty of technical work. He will also prepare catalogues, booklets and follow-up letters and attend to other advertising features of a like nature.

Noah W. Gray, for several years manager of the Carp furnace, Marquette, Mich., operated and owned by the Cleveland Cliffs Iron Co., has disposed of his interest in that plant and severed his connection with the company to devote his entire time to the business of the Boyne City Iron Co., Boyne City, Mich., which owns the Pine Lake furnace, of which he is secretary and treasurer. Austin Farrell, manager of the Marquette and Gladstone furnaces of the Cleveland Cliffs Iron Co., will add the management of the Carp furnace to his present duties.

President August Ziesing of the American Bridge Co. makes the following announcements: Emil Gerber, assistant to the president, will also be operating manager of the Pittsburg division comprising the plants at Ambridge, Canton, Shiffler and Toledo. R. J. Davis is to be operating manager of the Eastern division with plants at Athens, Berlin, Edge Moor, Pencoyd, Trenton, Elmira and Brooklyn. His headquarters will be at Philadelphia. E. A. Smith is to be operating manager of the Western division with headquarters at Chicago, and the following plants will be in his charge: American, Detroit, Lafayette, Lassig, Milwaukee and Minneapolis.

Frank Hooker Alfred, M. Am. Soc. C. E., is now associated with the Canadian White Co., Montreal, as general manager. He was educated at the University of Michigan and the Ohio State University and was for a time employed by the Norfolk & Western on field construction, and by the Hocking Valley railroad. He was then appointed engineer of maintenance of way for the Cleveland, Akron & Columbus railway and the Wheeling & Lake Erie. In 1900 he became division engineer of the Pere Marquette, being promoted two years later to the position of chief engineer. In this capacity he had charge of shop and terminal building at Chicago, Buffalo, Grand Rapids and St. Thomas, Ont.

CAPTAIN JOHN F. DRAVO DEAD.

Was Pioneer Railroad and Coal Man—Dean of Inland Navigation.

In the death of John F. Dravo, which occurred at Beaver, Pa., on Saturday last, Pittsburg lost one of its noted men and inland navigation its dean. Notwithstanding his age, 85 years, Capt. Dravo was actively engaged in business until the present summer.

Capt. Dravo was born at West Newton, Pa., Oct. 29, 1819, his parents being Michael and Mary (Fleming) Dravo. Educated in the common schools and at Allegheny College, Meadville, he engaged in teaching and, being gifted with speech, became a local preacher in the Methodist Church, with which he remained identified all his life. He learned the details of the coal business in his father's office, and in 1845 embarked in the coal business for himself. In 1854 he founded the town of Dravosburg, Pa., now a flourishing mining center, and while actively engaged in coal mining, he early saw the possibilities of improved navigation on the Monongahela and Ohio rivers. In 1868 he organized the Pittsburg & Connellsville Gas, Coal & Coke Co., becoming its general manager and treasurer. This company began with 40 ovens, and when Dravo retired from the presidency in 1883, it was operating 400 ovens. In 1876 Capt. Dravo was elected president of the Pittsburg Coal Exchange, which position he held continuously for 10 years. He was active in securing the organization of the Pittsburg Chamber of Commerce, was one of its charter members and for several years its president. It was largely through his efforts that the Government undertoook the improvement of the upper Monongahela river, and the location and erection of the Davis Island draw in the Ohio river. He was in the brunt of the fight for free navigation on the lower Monongahela, which was freed by the purchase of the existing locks and dams by the Government.

Empire Mill Doubles Capacity.

The Empire Rolling Mill Co., Newburg, Cleveland, O., which now has an annual capacity of 20,000 tons with two trains of rolls, is rushing work on improvements which will practically double the capacity of the plant. The contracts have been let to the Interstate Engineering Co., and it is expected that the addition will be completed by th first of February and possibly at an arlier date. Orders for the necessary machinery have been placed.

INDUSTRIAL STOCKS ARE NOW ACTIVE

SELL MODERATELY DESPITE THE HIGH MONEY RATES

General Gains Made By Leading Iron and Steel Securities —The Week's Review.

The advance of call money on the New York Exchange to 7 percent, the highest of the year, and the action of the Bank of England in raising its discount rate from 3 to 4 percent, a mark reached but four times in 20 years, were the features of last Thursday and Friday, which held the attention of dealers throughout the week and kept the market dull and otherwise uneventful. Trading was mostly speculative, several of the low-priced industrials, either non-dividend paying or with checkered dividend careers, selling actively on rumors of coming dividends, which in some cases were promptly denied officially. Securities were weak with general fractional declines until Saturday when, despite high money rates, the market strengthened on the publication of a favorable bank statement and closed firm. Stocks opened slightly higher on Monday, and increased the advance during the first half of the week. American Locomotive, Colorado Fuel & Iron, Pressed Steel Car, Railway Steel Spring, Republic Iron & Steel, Cast Iron Pipe, Sloss-Sheffield and the steel stocks were the industrial leaders with moderate selling and general advances. Railway Steel Spring netted an advance of five points on the declaration of another 2 percent dividend, placing the common on a 4 percent basis. During the week industrials largely took the place of railway stocks as market features.

Steel Foundries Makes Report.

(Special Telegram.)

New York, Oct. 4.—At the annual meeting of the American Steel Foundries Co., held at Jersey City, Oct. 3, the report was made that last year the company lost $329,000, in which was included, however, $317,000 spent in improvements. The Simplex Railway Supply Co., acquired last February, earned in 13 months $356,000, and the Commonwealth Coal Co., a part of the system, earned $20,000 in 10 months, neither of these being included in the foundries report. Judge E. H. Gary, president, declared the outlook hopeful, and added that all of the recent bond issues had been disposed of, half being taken by stockholders. The following directors were elected for three years: George B. Lighton, Max Pam, Edward Shearson, J. A. Middleton and John H. Harrison. The executive

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quotation, Sept. 25	Closing Quo. Oct. 2	Changes	Date of 1905 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Dec.
Allis-Chalmers Co.	17½	18¼	+ ¾	Sept. 7	100	19,820,000		.....	.....
Allis-Chalmers preferred	58	61	+3		100	16,150,000	7 cum	.....	Feb., 1904
American Can	11⅛	10¾	− ⅜	Feb. 7	100	41,233,300		.....	.....
American Can preferred	70¾	70	− ¾		100	41,233,300	7 cum	5 Q.	Oct., 1905
American Car and Foundry	36	37⅜	+1⅜	June 29	100	30,000,000		.....	May, 1904
American Car and Foundry preferred	99⅛	100	+ ⅛		100	30,000,000	7 n. c.	7 Q.	Oct., 1905
American Locomotive	52⅝	53⅞	+1⅛	Oct. 17	100	25,000,000		.....	.....
American Locomotive preferred	113¾	112⅜	− ⅜		100	24,100,100	7 cum	7 Q.	Oct., 1905
American Shipbuilding	56⅜	58⅛	+1⅝	Oct. 4	100	7,600,000	4	4 Q.	Sept., 1905
American Shipbuilding preferred	105¾	105¾	.....		100	7,900,000	7 n. c.	7 Q.	Oct., 1905
American Steel Foundries	9¼	10⅝	+1¼	Oct. 3	100	17,700,000		.....	.....
American Steel Foundries preferred	38¾	40¼	+1½		100	17,700,000	6 cum	.....	Aug., 1904
Barney & Smith	20	20	.....	June 6	100	1,000,000		.....	June, 1903
Barney & Smith preferred	128½	130	+1½		100	2,500,000	8 cum	8 Q.	Sept., 1905
Bethlehem Steel	29½	29½	.....	April 4	100	15,000,000		.....	.....
Bethlehem Steel preferred	87	88	+1		100	15,000,000	7 n. c.	7 Q.	Aug., 1905
Bullock Electric preferred	113	113	.....	Oct. 1	100	1,000,000	6	6 Q.	Oct., 1905
Cambria Steel	27¼	28½	+1½	March 21	50	45,000,000	6	3 S. A.	Aug., 1905
Cambria Iron	48½	49	+ ½		50	8,468,000	4	4 S. A.	Oct., 1905
Colorado Fuel & Iron	43⅞	46½	+2⅝	Oct. 16	100	30,132,000	7	.....	Apr., 1902
Colorado Fuel & Iron preferred	.....	.....	.....		100	2,000,000	8 cum	.....	Feb., 1903
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	28	28	.....	May 25	100	6,068,000	5	.....	Nov., 1902
Crucible Steel	12¾	13¼	+ ½	Oct. 18	100	25,000,000		.....	.....
Crucible Steel preferred	68½	68¾	+ ¼		100	25,000,000	7 cum	.....	Sept., 1903
Empire Steel	5	5	.....	Feb. 22	100	2,281,400		.....	.....
Empire Steel preferred	35	35	.....		100	2,500,000	6 cum	3 S. A.	Jan., 1905
Fay & Egan	60	60	.....	Feb. 21	100	1,000,000	5	5 Q.	.....
Fay & Egan preferred	118	118	.....		100	1,000,000	7 cum	7 Q.	Aug., 1905
General Electric	181	182⅜	+1⅜	May 9	100	48,256,050	8	8 Q.	Oct., 1905
International Pump	26½	22½	−4	June 6	100	12,262,500		2	July, 1905
International Pump preferred	82	79¾	−2¼		100	8,850,000	6 cum	6 Q.	Aug., 1905
Lake Superior Corporation	17	17	.....		100	40,000,000		.....	.....
Niles-Bement-Pond	126½	126½	.....	Feb. 1	100	5,000,000	6	6 Q.	Sept., 1905
Niles-Bement-Pond preferred	108	108	.....		100	2,000,000	6 cum	6 Q.	Aug., 1905
Otis Elevator Co.	60	60	.....	March 20	100	6,350,300		2 A.	Apr., 1905
Otis Elevator Co. preferred	109¾	108	−1¾		100	5,589,500	6 n. c.	6 Q.	Oct., 1905
Pittsburg Coal Co.	15	15½	+ ½	Feb. 11	100	30,135,000		.....	.....
Pittsburg Coal preferred	59½	59½	.....		100	30,716,200	7	.....	Apr., 1905
Pressed Steel Car	44¼	45½	+1¼	Feb. 15	100	12,500,000		3	Aug., 1904
Pressed Steel Car preferred	95½	98¼	+ ¾		100	12,500,000	7 n. c.	7 Q.	Aug., 1905
Pullman Palace Car	252	256	+4	Oct. 19	100	74,000,000	8	8 Q.	Aug., 1905
Railway Steel Spring	39½	46½	+5	March 2	100	13,500,000		4 S. A.	Oct., 1905
Railway Steel Spring preferred	98½	103	+4½		100	13,500,000	7 cum	7 Q.	Sept., 1905
Republic Iron & Steel	23½	24⅜	+ ⅞	Oct. 18	100	27,352,000		.....	.....
Republic Iron & Steel preferred	91½	93¼	+1¾		100	20,852,000	7 cum	7 Q.	Oct., 1905
Sloss-Sheffield	69	71¼	+2¼	March 15	100	7,500,000	5	5	Oct., 1905
Sloss Sheffield preferred	105	105	.....		100	6,700,000	7 n. c.	7 Q.	Oct., 1905
Tennessee Coal & Iron	86¾	88⅝	+1⅞	May	100	22,552,800		4 Q.	Nov., 1905
Tennessee Coal & Iron preferred	.....	.....	.....		100	248,300	8 cum	8 Q.	Nov., 1905
U. S. Cast Iron Pipe & Foundry	31	33	+2	June 28	100	12,500,000		.....	.....
U. S. Cast Iron Pipe & Foundry preferred	91½	93⅞	+2½		100	12,500,000	7 n. c.	7	Sept., 1905
U. S. Steel	37⅝	38⅝	+1	April 17	100	508,302,500		.....	Dec., 1903
U. S. Steel preferred	104½	105½	+1½		100	360,281,100	7 cum	7 Q.	Aug., 1905
U. S. Steel 5's	97 ¾	98	+ ¼		100	463,798,000	5	5 A.	
Virginia Iron, Coal & Coke	42½	39½	−3	Sept. 19	100	8,641,600		.....	.....
Westinghouse Electric	170	169½	− ½	June 28	50	20,996,350	10	10 Q.	Oct., 1905
Westinghouse Air Brake	149	.....	.....	Oct. 3	50	10,990,450	20	20 Q.	Oct., 1905

committee was abolished, and the directors hereafter are to meet monthly instead of quarterly. Announcement was made that the general offices would be removed to Chicago.

New Westinghouse Directors.

(Special Telegram.)

Pittsburg, Oct. 4.—At the annual meeting of the stockholders of the Westinghouse Airbrake Co., held yesterday, no change was made except the election of two new directors, George C. Smith, of the Security Investment Co., and H. G. Prout, vice president of the Union Switch & Signal Co., a Westinghouse interest. The other directors are: George Westinghouse, H. H. Westinghouse, John Caldwell, E. M. Herr and Robert Pitcairn. George Westinghouse is president. The annual report was made public a fortnight ago.

Financial Notes.

The annual meeting of the Ohio Bankers' Association held in Cleveland last week was the occasion for the publication of a special "Cleveland Convention Number" of Finance. In addition to a complete report of the week's proceedings the number contained numerous writeups on Ohio financial institutions with many handsome illustrations. The Cleveland Commercial Bulletin also covered the bankers' meetings in a very complete manner.

Jacob Cohen, Jacksonville, Ill., whose affairs were recently forced into the federal courts, announces that he has settled and has re-entered business at his old location under the name of Jacob Cohen & Son. The firm will buy iron, steel, metals, etc.

The stockholders of the Niles Boiler Co., Niles, O., have decided on the $50,000 increase of capital stock. E. A. Gilbert, acting superintendent, recently resigned, and was succeeded by J. S. Pell, of Akron.

The Chicago Pneumatic Tool Co. has declared a quarterly dividend of 1 percent, payable Oct. 25. Vice President W. O. Duntley and W. A. Mitchell, patent attorney, were added to the executive board.

Henry L. Lumis has been appointed trustee in the involuntary bankruptcy proceedings instituted by the Pennsylvania Steel & Iron Co.

The statement of the Tennessee Coal & Iron Co. for the five months ending May 31, submitted to the New York Stock Exchange in connection with the listing of additional bonds, shows that the earnings for that period were at the rate of a little more than 3 percent on the common stock.

The capital stock of the Bullock Electric Mfg. Co., Cincinniat, is to be increased from $500,000 to $3,000,000. Of this increase $1,500,000 is to be 6 percent cumulative perferred stock, dividends payable annually, and the remainder common stock. The increase will provide funds to carry out extensive improvements now contemplated.

The failure of C. E. Morris, recently noted in this column, does not affect the C. E. Morris Co., whose iron works at Columbus, O., are enjoying heavy business.

The annual meeting of the Dominion Iron & Steel Co., Sidney, N. S., will be held Oct. 18. The company is said to be earning about 7 percent on its preferred stock.

A dividend of 2 percent has been declared on the preference shares of the Nova Scotia Steel & Coal Co., payable Oct. 14.

The declaration of the second 2 percent dividend on the Railway Steel Spring Co.'s common stock for 1905 is regarded as establishing that stock on a permament 4 percent basis. F. F. Fitzpatrick, general sales agent of the company, has been elected a vice president.

APPRENTICES' EDUCATION

Discussed by Cincinnati Metal Trades Association—The Quarterly Dinner.

The first of the winter dinners of the Cincinnati Metal Trades Association, was held in connection with the regular quarterly meeting at the Grand Hotel, on Thursday evening, Sept. 28.

The meeting was strictly a business one, and the subjects under discussion were interesting and served to hold those present in close attention. The first matter of business was the adoption of a new constitution, in conformity with the National Metal Trades Association, which was necessary since the decision of the local association to merge itself into the national body, some time ago.

Mr. F. A. Geier, of the Cincinnati Milling Machine Co., spoke at some length on this subject, expressing his satisfaction at the action taken, and outlining the benefits that would accrue to the local association, under the plan now operative, the local having become a part of the national organization.

Mr. John M. Manley, the secretary of the Cincinnati body, spoke of the increasing interest of the members in the workings of the association, and of the hearty support he was receiving in his work as the executive officer of the association.

There was a general discussion in regard to the matter of apprentices. Mr. E. H. Hargrave, of the Cincinnati Tool Co., advanced the idea of giving the apprentices some systematic educational opportunity, and was in favor of sending the apprentices to the Mechanics' Institute at the expense of the firm in whose shop the apprentice was employed.

Mr. Harry Hoefinghoff, of the Bickford Drill & Tool Co., spoke on the same question, and said that it was apparent that some method should be followed that would bring the apprentice to a higher standard of intelligence and better educational condition at the close of his apprenticeship, than at present prevailed.

Mr. W. P. Eagan, commissioner of the National Metal Trades Association, spoke on the subject of "Organization."

There were interesting addresses made also by Mr. Wm. Lodge, of the Lodge & Shipley Machine Tool Co., Mr. J. B. Doan, of the American Tool Works Co., Mr. J. H. Day, of the J. H. Day Co., Mr. H. M. Lane, of the Lane & Bodley Co., and Mr. Robert Wuest, of the National Metal Trades Association.

Mr. P. G. March, of the Cincinnati Shaper Co., the president of the association, presided over the meeting and Mr. J. M. Manley acted as secretary.

Those in Attendance:

P. G. March, The Cincinnati Shaper Co.
J. M. Manley, Cincinnati Metal Trades Association.
E. S. Hargrave, The Cincinnati Tool Co.
Wm. Lodge, Lodge & Shipley M. T. Co.
J. F. Hirst, J. A. Fay & Egan Co.
J. W. Neil, The J. H. McGowan Co.
D. C. Jones, The Lunkenheimer Co.
H. Ritter, The Lunkenheimer Co.
B. Sebastian, The Sebastian Lathe Co.
J. May, The Sebastian Lathe Co.
T. L. Greenwald, The I. & E. Greenwald Co.
C. F. Greenwald, The I. & E. Greenwald Co.
H. M. Lane, The Lane & Bodley Co.
Robert Wuest, National Metal Trades Association.
W. P. Eagan, National Metal Trades Association.
W. Laidlaw, The Laidlaw-Dunn-Gordon Co.
F. A. Geier, The Cincinnati Milling Machine Co.
A. H. Teuchter, The Cincinnati Machine Tool Co.
S. C. Schauer, The Cincinnati Machine Tool Co.
John LeBlond, The R. K. LeBlond Machine Tool Co.
F. Von Wyck, The Von Wyck Machine Tool Co.
O. J. Schafer, The Globe Pattern Works.
O. Mueller, Mueller Machine Tool Co.
L. C. Twachtman, Fosdick Machine Tool Co.
J. H. Day, The J. H. Day Co.
Harry Dolle, The National Machine Tool Co.
C. Naber, The National Machine Tool Co.
J. B. Doan, The American Tool Works Co.
B. B. Quillen, The Cincinnati Planer Co.
H. Hoefinghoff, The Bickford Drill & Tool Co.
Al. Robinson, The American Tool Works Co.
H. Biehler, The Bickford Drill & Tool Co.
N. R. Chace, The Cincinnati Shaper Co.
H. G. Dreses, The Dreses Machine Tool Co.
M. R. Conway, Conway & Co.
R. K. LeBlond, R. K. LeBlond Machine Tool Co.
Wm. Greaves, Greaves-Klusman & Co.
O. H. Broxterman, The Jno. Steptoe Shaper Co.

CAR WHEEL SPECIFICATIONS

And Partamol Discussed at Meeting of Pittsburg Foundrymen's Association.

A paper on "Partamol," parting made by the Partamol Co., New York, by Wm. Dinkenspiel, of the company, and a discussion of the recommended specifications for cast iron occupied the attention of the Pittsburg Foundrymen's Association at the regular meeting held Monday evening, October 2, at Engineers' Hall, Pittsburg.

Partamol is a parting compound which has given excellent results in intricate and fine castings. It is dusted on very sparingly and "stays put." In the discussion Mr. B. D. Fuller remarked that while the cost of lycopodium was constantly advancing, and had now reached about a dollar a pound, it did not stand at as great disadvantage with partomol at 20 cents a pound as might be supposed, as he took it the relative specified gravities were about as 1 to 4. Mr. Dinkenspil stated in reply that the relation was about as 2½ to 1, and that his company was constantly improving the character of partamol so that it would absorb less moisture.

The discussion on "Recommended specifications for cast iron" could not be carried out, as Mr. H. E. Field, who was to lead the discussion with Mr. A. W. Slocum, had been called out of town.

Mr. Slocum presented a discussion of the specifications adopted last summer by the American Society for Testing Materials, from the standpoint of the car wheel manufacturer. He pointed out that while the specifications adopted were quite rigid the railroads would still demand a guarantee of service, 80,000 miles, so that the car wheel maker would have to serve two masters. Then, further, the analysis of 2.90 percent graphitic carbon and 0.60 percent combined carbon, does not, in Mr. Slocum's opinion, conform with the requirements of chill, not under ¾ inch nor more than ⅞ inch, inasmuch as. to conform with other conditions, the manufacturer would be forced to work up close to the maximum of chill, and to produce such a chill would be almost a physical impossibility, with the required percentages of grahpitic and combined carbon. He mentioned some satisfactory wheels which had 1.30 percent of combined carbon and insisted that none of the car wheel makers were producing wheels of less than 1.00 percent combined carbon. If wheels do not stand a service of five years the manufacturer is liable to pay a penalty of $2.00 per wheel. The drop test was also objected to, as the other requirements should guarantee good wheels, and the drop merely wastes a wheel for each lot.

The provision that wheels bearing date more than 30 days prior to inspection will not be accepted, except by special permission, is, in Mr. Slocum's judgment, a hardship on the manufacturer. It frequently happens more wheels are made than are needed on an order, and it should not be made so difficult for manufacturers to carry them. The permission to submit older wheels, while obtainable, is only obtained as a special favor, and manufacturers are likely to wear out their welcome while preferring to save the spirit of accommodation on the part of the railroad superintendent for other purposes.

On account of wear of chillers, the shrinkage test required would necessitate the replacement of chillers every six months or so, when under previous conditions they can be used for two or three years.

Special criticism was made by Mr. Slocum of the requirement that wheels will be considered to have failed which "do not conform to standard design and measurement." He asks: "Is there a standard?" There is the M. C. B., the Harriman, the Big Four, the Pennsylvania, the four distinct standards of the Baltimore & Ohio, etc.

Following this partial discussion of the subject, the association arranged for committees to work up the matter, appointing Mr. H. E. Field chairman of a committee on standard specifications in general, and A. W. Slocum as chairman of a committee on car wheel specifications in particular, each chairman to appoint four members to make up a committee of five.

The nominating committee presented the following names of gentlemen to serve as officers and committee members during the ensuing year:

President: B. D. Fuller, Westinghouse Electric & Manufacturing Co.

Vice-President: Henry J. Spilker, Sterrett-Thomas Foundry Co.

Treasurer: J. S. Seaman, Seaman-Sleeth Co.

Secretary: F. H. Zimmers, Union Foundry & Machine Co.

Executive Committee: W. H. McFadden, J. S. McCormick, S. D. Sleeth, John Phillips, G. C. Shade.

Program Committee: E. D. Frohman, A. W. Slocum, H. E. Field.

The chairman announced that Mr. Seaman had hoped to be present, but was prevented by sickness in the family, and had made an earnest request that he be relieved from further duties. It was decided that Mr. Zimmers could act as treasurer, and an election was made on the above basis, Mr. F. H. Zimmers being elected both secretary and treasurer.

Those in Attendance.

H. M. Wilson, W. P. Snyder & Co.
H. P. Spilker, Sterit-Thomas Co.
William Yagle, Yagle Foundry & Machine Co.
I. Ackerman, United Engineering & Foundry Co.
E. D. Frohman, S. Obermayer Co.
T. E. Malone, J. S. McCormick & Co.
William Dinkelspiel, Partamol Co., New York.
H. Penrose, L. & R. Wister & Co.
J. S. McDonald, Westinghouse Electric & Mfg. Co.
S. D. Sleeth, Westinghouse Air Brake Co.
B. D. Fuller, Westinghouse Electric & Mfg. Co.
W. J. Davis, H. K. Porter & Co.
W. J. Brant, Chicago Flour Co.
A. M. Slocum, National Car Wheel Co.
J. K. Beam, Carnegie Steel Co.
Henry Ow, Carnegie Steel Co.
W. H. McFadden.
V. A. Girsey, Harbison-Walker Refractories Co.
K. Seaver, Harbison-Walker Refractories Co.
O. L. Jones, Harbison-Walker Refractories Co.
Paul Kreutzpointner, Pennsylvania railroad, Altoona.
James Young, foreman brass shop, Pennsylvania railroad, Altoona.
H. M. Wolfe, *The Iron Age.*
Geo. H. Gall, *The Iron Trade Review* and *The Foundry.*
B. E. V. Luty, *The Iron Trade Review* and *The Foundry.*

Bridge Workers Continue Strike:

J. J. McNamara, secretary and treasurer of the International Association of Bridge and Structural Iron Workers, with headquarters at Cleveland, O., states that the indorsement of the strike now pending against the American Bridge Co., at the recent Philadelphia convention, means that all contracts in which that company is suspected of being interested will be investigated. In case any substantiation of the association's suspicions is discovered, Mr. McNamara says, a strike will be ordered. The association numbers about 28,000 members, of which about 5,000 are now out. The new officers chosen by the association are: F. M. Ryan, Chicago, president; E. A. Clancy, San Francisco, first vice president; John Berry, St. Louis, second vice president; J. J. McNamara, Cleveland, secretary and treasurer.

Water for Steel Plants.

The Mahoning Valley Water Co. has started work on a big reservoir to be built on Yellow Creek, near Struthers, O. A dam will be thrown across a valley and a lake of large acreage formed from which water will be supplied to the steel plants and shops below. The securing of a sufficient water supply has been a serious problem with iron and steel interests in that section.

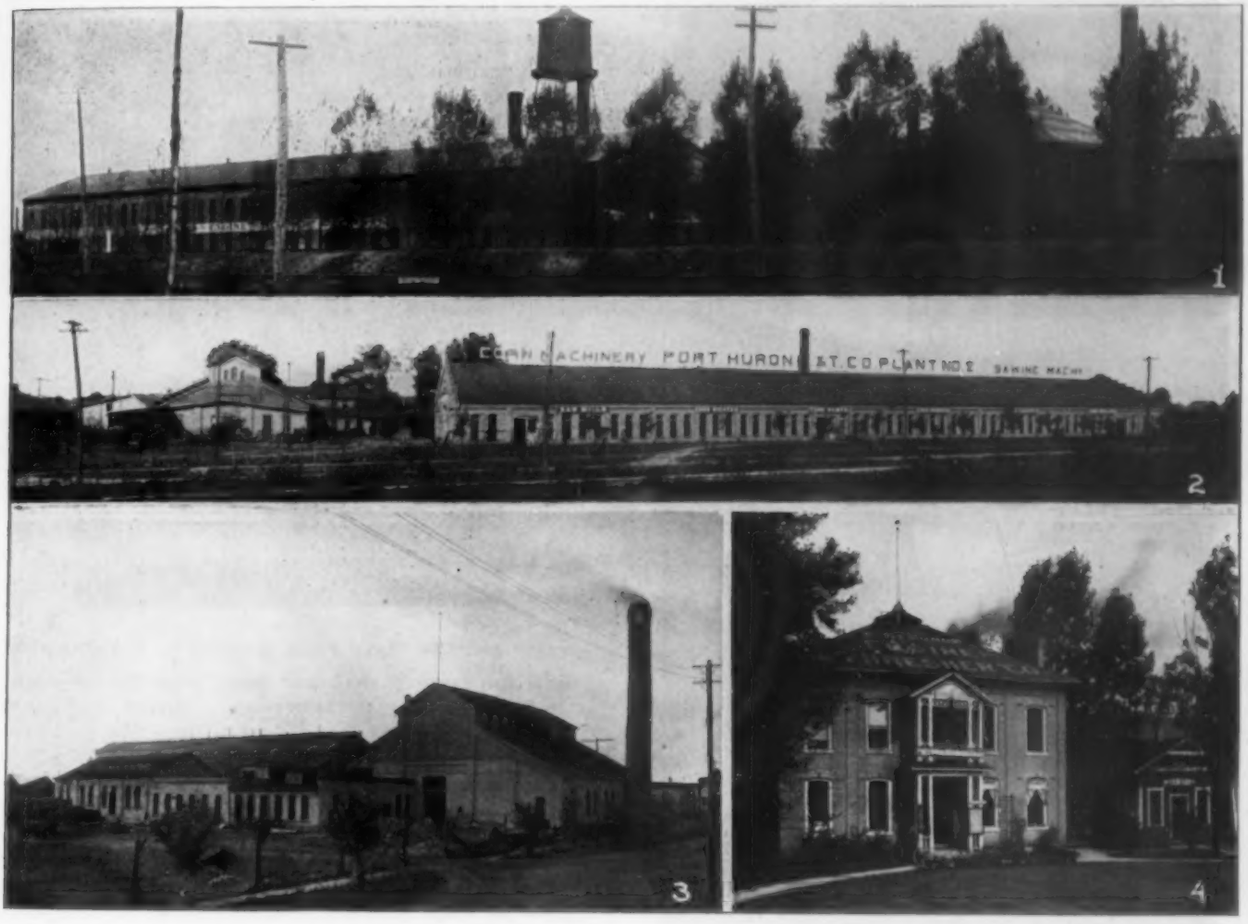
The Machine Tool Builders' Association will hold its fall meeting Oct. 16, 17 and 18, at the Hoffman House, New York.

Plant of the Port Huron Engine & Thresher Co., Port Huron, Mich.

(STAFF ARTICLE.)

Many tourists who have been up and down the Great Lakes have seen the long buildings of the No. 2 plant of the above named company just below Port Huron on the bank of the St. Clair river, and rising from behind the No. 2 plant can be seen the stacks of the No. 3 plant. The No. 1 plant, which is the original works, is located about a mile from the other two properties, much nearer to the center of the city.

This company had its origin in a small company making agricultural implements which began business in Battle Creek, Mich., in 1874. Ten years later the plant was moved to Port Huron and in 1890 the company was reorganized and the present name adopted. Since that time the business has grown rapidly and many new lines have been added as the business grew. Today the principal lines of manufacture are traction engines, separators, wind stackers, plowing rigs, road making machinery, heavy trucks for the transportation of material upon wagon roads using a traction engine as a source of power, corn harvesting machinery, hay presses, portable saw mills and other similar machinery. In addition to this it does a general jobbing line at its malleable plant covering all classes of small malleable castings.



1.—PLANT NO. 1. 2.—PLANT NO. 2. FOUNDRY AT LEFT. 3.—PLANT NO. 3, MALLEABLE FOUNDRY. 4.—GENERAL OFFICE AT PLANT NO. 1.

No. 1 Plant.

The company is mainly noted for the high class traction engines which it manufactures. This engine is shown in one of the accompanying illustrations. The compound engine mounted upon the boiler is capable of developing about 75 h. p., but the machine is rated as a 30 h. p. engine as it is sold with a guarantee to have a pulling capacity of 30 horses when used for traction purposes either on the road or in plowing. There are three principal fields into which these engines are sold. First, there is the old home trade which was originally built up in the agricultural districts of Michigan, Wisconsin and other neighboring states. Second, there is the wheat raising district of the Central Northwest, and especially of the Canadian Northwest. Third, the company has developed a very extensive South American trade; namely, in the Argentine Republic, where a large number of these engines are sold each year.

As is usually the case with any progressive concern, the engine in its present form is the result of a gradual development which has brought it to its present high degree of perfection. The peculiar construction of the tire of the traction wheels is one of the first things that attracts one's attention. This is a patent wheel which has been developed to prevent clogging when working on muddy roads, in the snow or under similar difficult conditions. The track left by one of these wheels is shown

in Fig. 2. Just as the rims of the wheels start to rise from the ground they tend to crowd the material in the groove backward, and this prevents its sticking and being lifted by the wheels. When the wheel is provided with ordinary straight bars or grooves this action is not possible and such wheels ball up badly on slippery or sticky roads.

The construction of both the front and back wheels are such as would ordinarily give a large amount of trouble in a foundry and it is certainly a credit to the work of

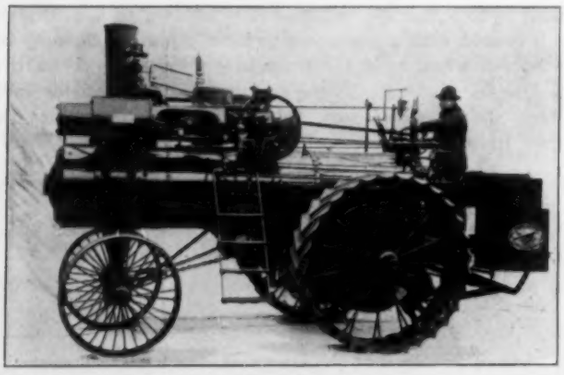


FIG. 1.—PORT HURON PORTABLE ENGINE.

the founders of this company that these wheels are turned out without any difficulty. The molds are constructed in green sand in three part flasks; the pattern being so constructed that it can be screwed out of the sand. The ends of the wrought iron spokes are then fluxed with red lead and placed in the mold. The rims of the wheels are cast one day and the hubs the next. This gives a rigid wheel and the right amount of tension in the spokes.

Everything about the works has been thoroughly sys-

FIG. 2.—TRACK OF TRACTION WHEEL.

tematized. The various parts are made in different departments and stored in suitable racks, bins or upon shelves ready for erection. In the department in which engines are erected the boilers are first brought out from the boiler shop and laid upon the floor wrong side up. The casting for the ball and socket support, for the front wheels, for the boxes for the shaft for the hind wheels, and other attachments for the lower part of the engines are put in position. The boiler is then picked up by a traveling crane, turned over and moved to the next berth on the floor where the wheels are placed in position. The engine, steering gear and other parts are next mounted in place. Every boiler is tested four times before it leaves the works. First, the boilers are tested under hydraulic pressure in the boiler shop, which, by the way, is equipped with all modern appliances necessary for cheap and expeditious construction of boilers.

After the engine has been erected steam is turned into it from another boiler and any leaks which may develop are caulked and the boiler thoroughly inspected. The engines are then put under steam with a fire in their own boilers and run out into another building. They are finally placed in the testing room and run loaded for several hours to limber up all the parts and bring the engines into perfect working condition in every respect. After everything is complete and the final tests have been conducted

FIG. 3.—TROLLEY TRACK FROM FOUNDRY TO MACHINE SHOP.

the engines are painted and made ready for shipment. Those to be shipped to foreign countries are boxed. Many of the engines for local trade leave the works under their own steam.

The separators and wind stackers are also built at the No. 1 plant, and the departments for building each class of manufacture are so arranged that each machine passes through continuously from the time erection begins. In the various wood working, and metal working departments the truck system is used throughout. For instance, a given number of pieces of wood are sawed out and piled on a truck. These are sent to a machine to have certain operations performed upon them. As the operations are performed the pieces are loaded onto another truck. When the next operation is performed, either at the next machine or at the bench the pieces will be returned to the first truck. In this way there is no possibility of omitting an operation upon a piece and there is no unnecessary handling of material. When the pieces are finally completed the truck is run to the place where they are to be stored and there unloaded. The pieces are placed in a bin or upon the shelf where they belong. So far as possible these storage bins are arranged along the erecting floors so that as a machine is moved down the floor during the progress of erection the required pieces will always be found in the nearest bin. A ticket system is used in giving out the work to the men and the records

compiled from these tickets serve to show just the condition of work in any department.

In the foundry at the No. 1 plant the heavy work is all performed with jib cranes or overhead trolleys upon which pneumatic motors are used in most cases. For conveying the castings from the foundry to the machine shop the Coburn trolley track system is used, as shown in Fig. 3. This illustration shows one of the large driving wheels being transported from the foundry to the machine shop. The man shown in the illustration handles all of the castings from the foundry to the machine shop and before the Coburn trolley track system was installed it required several men to look after this work. The overhead carrier system is to be extended to a number of departments where it has not yet been used as the company is very well pleased with its operation. In the machine shop, erecting shop, wood working shop, and other departments, various styles of traveling cranes and jib cranes are installed wherever they are necessary and many of them are equipped with pneumatic hoists.

All of the machines which have operating mechanism are tested before leaving the plant. For instance all separators are belted up and run with their belts on to limber up the machine and bring all the bearings into the best possible condition.

Plant No. 2.

This is located a little over a mile from No. 1 plant on a tract of land which has been laid out especially for manufacturing purposes. The company in charge of the allotment has made provisions for docks on the river, and has a belt railway connecting the different plants, and it is probable that ultimately all the works of the company will be concentrated upon this road, as both the No. 2 and No. 3 plants are at present. The No. 2 plant is devoted to the manufacture of saw mills, corn harvesting machines and several other lines made by the company. The main building is 60 x 360 ft. and contains a machine shop and woodworking department, the boiler plant being located in a wing. Back of the main building there is another building 60 x 270 ft., containing a blacksmith shop, erecting department, paint shop, etc. The foundry is located at the one side of the property; the main building being 60 x 120 ft. with a cleaning room 60 x 30 ft., and a wing containing the cupola, core department, storage shops, etc. The pattern storage is located in a two-story building, 33 x 61 ft. In this plant, as in the No. 1 plant, the truck system is used throughout for handling material, and during erection the machines are placed in such a position that the least possible amount of handling is required in putting the parts together. The machine department is equipped with thoroughly up-to-date machinery, and wherever necessary hoists are installed to assist in handling the heavier parts.

A great deal of attention has been given to the construction of jigs, special fixtures and other devices for facilitating the handling of work and making the machines interchangeable. Some of the smaller machines are erected on the floor opposite the machine department.

The office of the superintendent of the plant is located in the middle of the one side of the main building, which gives every possible facility for looking after the work.

FIG. 4.—WOOD WORKING DEPARTMENT AT NO. 2 PLANT.

The foundry connected with the No. 2 plant is a splendid example of foundry work adapted to the line of machinery being manufactured. Every part of the equipment has been carefully thought out to fill the special requirements to be met. Molding machines are used for some of the standard work, while special flasks, follow boards or other necessary equipment are furnished wherever required in connection with the heavier work. The larger molds are made under swinging jib cranes.

There has been considerable discussion from time to time as to the best method of casting a cylinder about an iron or steel shaft. This is being done successfully every day in the No. 2 foundry. Special iron flasks have been made for the work and the piece is molded horizontally, the gate being formed in one end. After the mold is closed with the shaft in place the flask is firmly clamped and then lifted up on end in a pit prepared for it, the pouring being done from one end. This prevents the springing of the shaft as the hot metal rises about it and the

molder in charge of this work has the enviable record of a long series of successful molds without a single bad casting.

Much careful thought has evidently been spent on the large proportion of the riggings used, and this, together with a careful supervision which the work receives in all of the foundries belonging to this company, goes a long ways toward explaining their financial success, and is one reason why foundries of moderate size can often produce better work and at lower prices than is possible in the large manufactories employing thousands of men, but in which the personal element in the management is lost, and as a consequence the percentage of spoiled work is always high.

In connection with the No. 2 plant there is a storage shed of rather a unique construction. There is a cement floor of over an acre in extent in which are bedded round posts, which carry purlines for supporting roof rafters. The roof is covered with tarred paper and slopes both ways from the center. The front of the shed is left open but the ends and back closed. As fast as the work is completed it is run into the storage shed until required for shipment.

No. 3 Plant.

The No. 3 plant is devoted entirely to the manufacture of malleable iron castings. Like the other plants this one has its shop office located at the plant, and all of the general office work necessary in connection with the plant is carried on here. The office is situated in a building at the front of the plant proper.

Following the work through the plant we come first to the metal pattern room, which is in a building immediately back of the office. This department is equipped for the manufacture of both metal and wooden patterns, including machine tool equipment, a molding bench and melting furnaces for casting metal patterns.

Most of the malleable iron castings used by the company are of comparatively small size, and hence to keep the plant running to its full capacity they do a general jobbing business in small and malleable castings including a large variety of exceedingly intricate and difficult work. All of the patterns for this class of work are made in the metal pattern department.

Adjoining the pattern shop on one side are the pattern vaults, of which there are 12. These are of brick construction, fire-proof and provided with iron doors. The

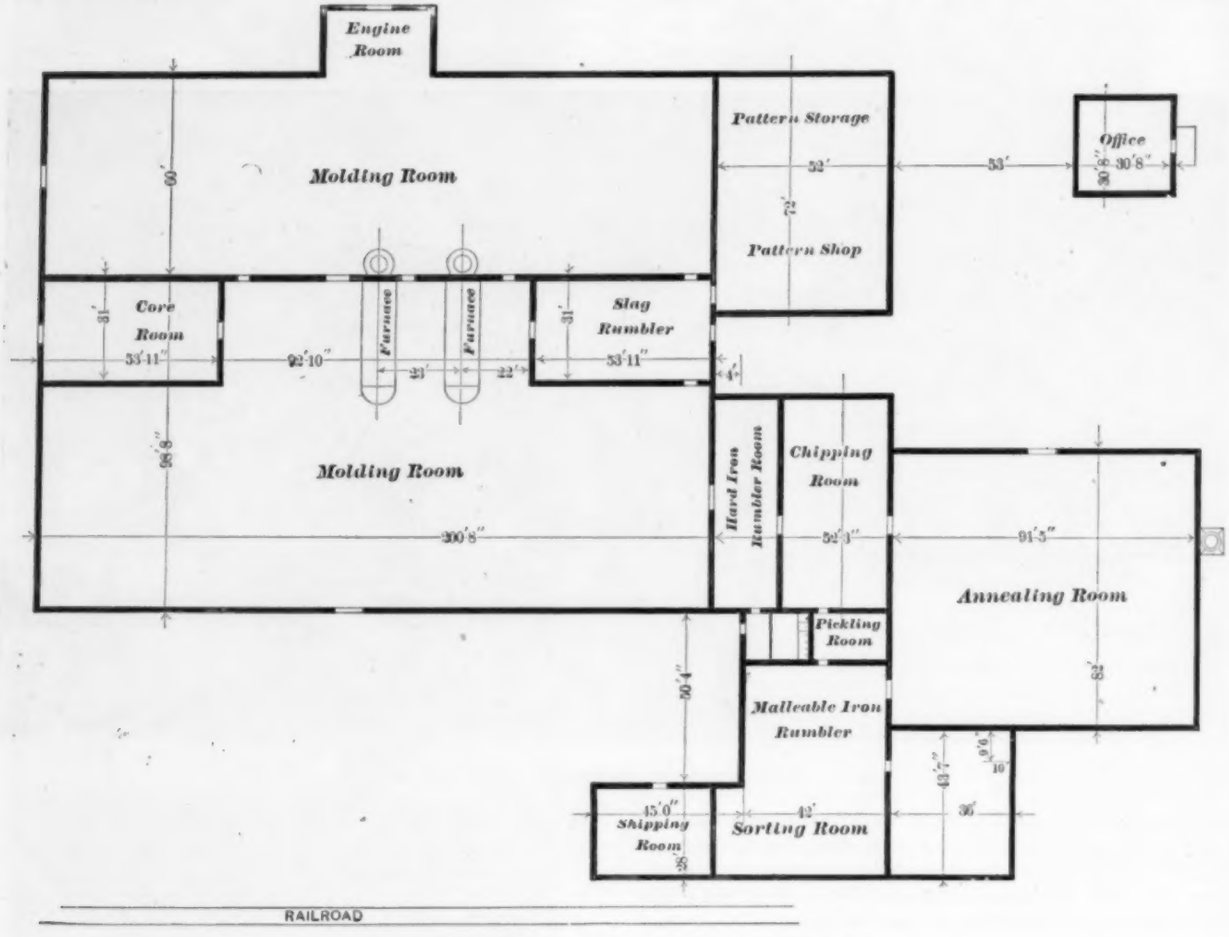
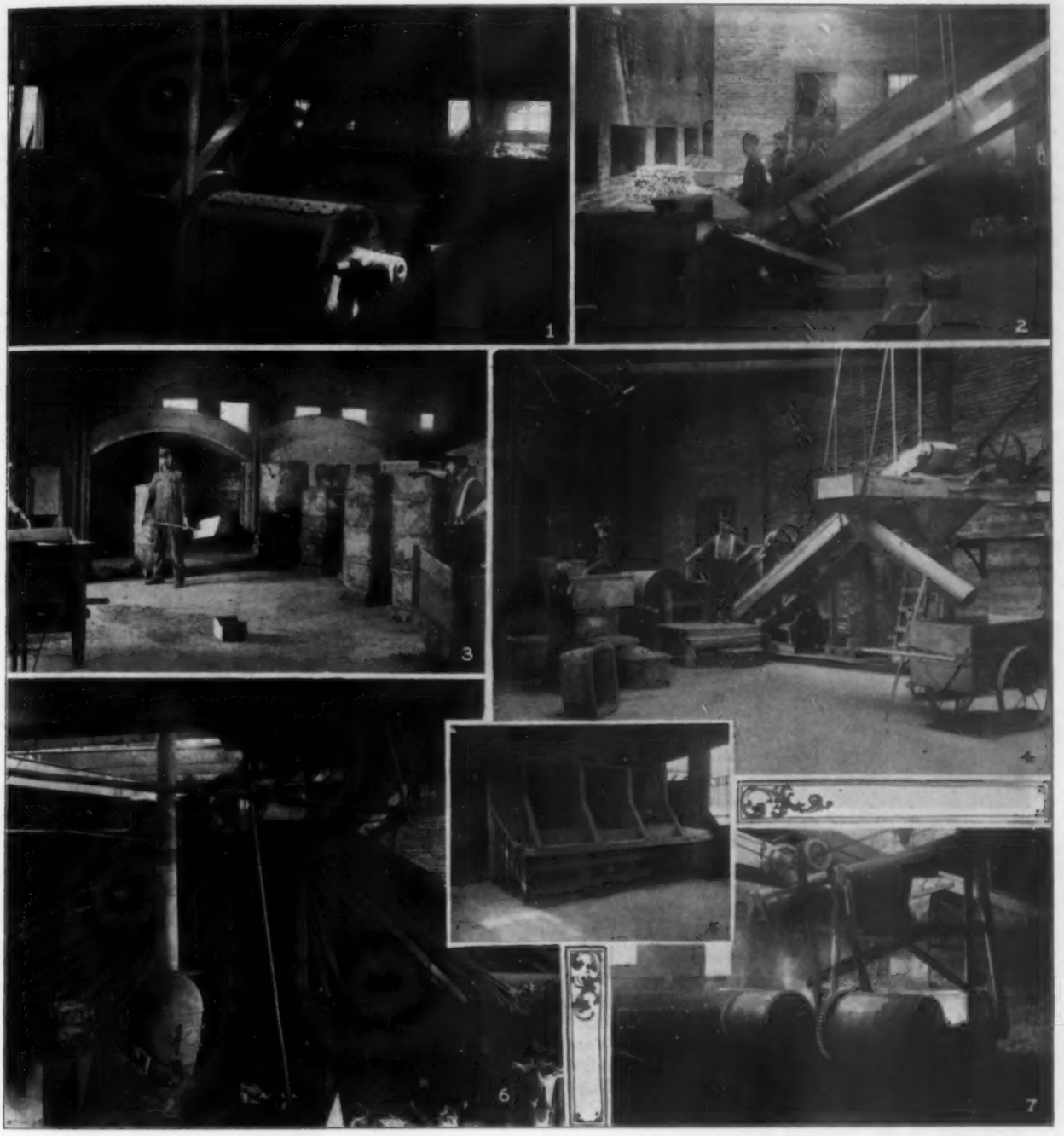


FIG. 5.—PLAN OF NO. 3 PLANT, MALLEABLE FOUNDRY.

general receiving room, between the metal pattern department and the vault, is shown in one of the accompanying illustrations, most of the doors in the vaults being closed. The wire screen shelves on both sides of the room are used for arranging the work for the foundry and for assorting out and inspecting the patterns when they are returned. As orders for work are received, the proper patterns are assorted out, ticketed and placed upon certain shelves. As the foreman in the foundry requires more work, he calls upon the man in charge of the storage room to issue to him the patterns together with the order tickets. When the work is complete the patterns are returned, inspected and if in good condition sent to the pattern storage; but if the pattern is not in good condition



1, HARD TUMBLING BARRELS. 2, SORTING HARD CASTINGS. 3, ANNEALING OVENS AND PACKING POTS. 4, SHAKING OUT POTS ON THE LEFT AND MACHINERY FOR CLEANING PACKING MATERIAL ON THE RIGHT. 5, BINS FOR RECEIVING HARD CASTINGS. 6 SORTING, MACHINE FOR SOFT CASTINGS. 7, SOFT TUMBLING BARRELS.

it is immediately repaired before it is returned to the storage.

The melting equipment consists of two eight ton air furnaces, which are used alternately. Ordinarily two heats per day are taken from one furnace, all of the iron being carried to the floors in 40-lb. ladles. The furnaces are located in the center of the foundry between two casting floors, each of equal area. At one side of the furnace is located the slag rumbler for cleaning the slag, and at the other end the core room and core ovens.

All who have had experience in malleable work know that the handling, cleaning and annealing of small work is by far the most expensive part of the process, and in connection with this plant a very large amount of thought has been given to the simplifying of this process.

As far as can be seen the bad work is assorted from the good upon the molders' floors and the good is counted. With this count the bad and broken are carefully checked. Any unseen bad work is afterwards picked out during the inspection in the trimming room and discounted on the former checking.

As the castings come from the foundry they are put through a battery of four exhaust tumbling barrels in the hard iron tumbling room. When the castings are discharged from the barrels they are shoveled through openings in the wall on to the sorting benches in the next

room. Here they receive a rapid inspection and are assorted into general classes, each class being thrown onto an incline belt conveyor which conveys, and, at the same time, elevates the pieces to a series of automatic weighing machines in the annealing room. These machines, after weighing the material, discharge it into bins in one corner of the room.

In the annealing room the pots are packed on the floor in front of the bins containing the castings; the packing material being delivered in trucks. When filled the pots are placed in the annealing oven in the ordinary manner and annealed. When cooled the pots are placed under a swinging crane which is used in shaking them out. A section of a pot is swung over a hopper by the crane and the packing material, the castings and all are allowed to fall into the hopper. Beneath this hopper is an automatic feeding device which discharges the material into an ordinary revolving screen or trommel.

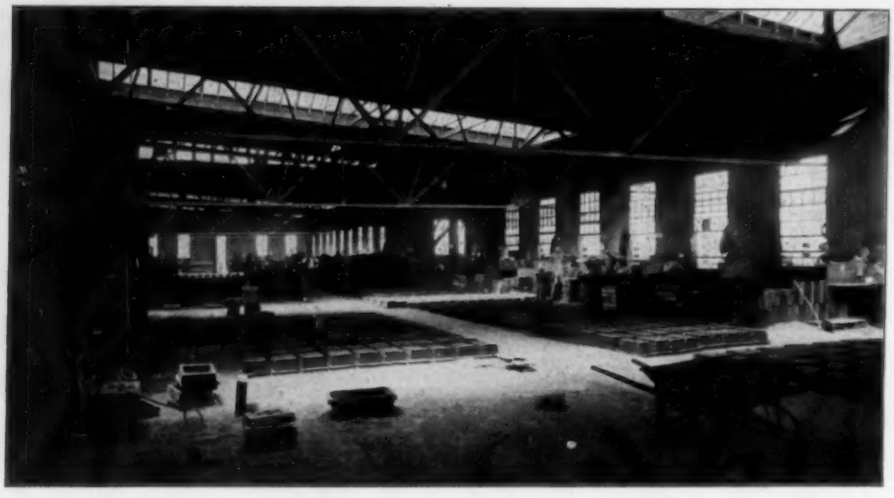


FIG. 6.—ONE OF THE MOLDING FLOORS AT THE MALLEABLE FOUNDRY.

The packing material passes through the holes in the screen while the castings are discharged from the end. The packing material is received on an incline conveyor which elevates it to a shaking screen for removing the dust, and then discharges the clean packing material into trucks to be taken to the packing floor. The dust removed from the packing material is carted to the dump.

At this point it may be of interest to state that the packing material first used was an ordinary mixture of rusted steel chips, but that at present this is mixed with a very large amount of crushed slag from the melting furnaces which is found to work satisfactorily.

Returning to the revolving screen used for separating the packing material from the castings we will trace the castings through to the shipping room. As the castings are discharged from the revolving screen they are received on an inclined belt elevator which delivers them to an inclined chute that can be swung over any one of the soft tumbling barrels.

When the castings have been cleaned in the barrels they are discharged into a hopper which delivers them to another inclined belt conveyor by which they are elevated to a bin above the assorting tables. The assorting tables are elevated and are surrounded with a series of chutes for delivering the castings to special truck boxes. By this device two men can assort more castings than a dozen could under the old system. After the truck boxes beneath the lower end of the chutes are filled they are titled and wheeled to the inspecting tables.

For dumping the boxes onto the inspecting tables, a special hoist is used which swings the boxes from the tables and inverts them at the same time, thus dumping the entire contents out before the inspector. As the castings are inspected they are placed in bags for shipment or into truck boxes for transportation to the different departments in either the No. 1 or No. 2 plants. The handling devices at this plant including all the arrangements from the hard iron cleaning room to the assorting room have been included in patents which have been applied for by Mr. G. F. Conner, who was formerly general superintendent of the plants.

This company manufactures one and one-half million dollars worth of machinery during a year which is disposed of through the sales agents located in various places and by means of their own mail soliciting department located in Port Huron. To assist in carrying on their publicity work the company has a fully equipped printing office in which all of the circulars, catalogues and other advertising matter necessary are printed. It is also interesting to know that most of the salesmen of the company are old thresher operators who have grown up in the business, and who are mutually interested in the success of the company. In fact, one thing which impresses a visitor more than almost anything else is the harmony which exists between all departments and the interest that every man takes in the success of the plant, and not only in the plant, but in the entire community. During the writer's visit of several days he did not run across a single person who thought he could run the affairs of the company better than those now in charge, and this is certainly a remarkable statement to be able to make about any company doing the volume of business handled by this concern.

Port Huron is very well situated for a manufacturing town. There is room for very extensive docks along the

FIG. 7.—METAL-PATTERN VAULTS.

river, while the land back of the river is mostly a flat, sandy plain, which is high enough to afford good drainage, and at the same time the soil firm enough to form good foundations. There are good railroad facilities and land is not expensive. The town offers special inducements to manufacturing establishments who locate there.

GAS POWER vs. WATER POWER.

In the October issue of *Power*, Mr. H. G. T. Horace presents the rather startling suggestion that electric power may be obtained more cheaply from producer plants and gas engines, than from water power plants. We reprint Mr. Horace's article below:

The writer and the chief engineer of one of the large water-power plants were having a discussion regarding the cost of construction and maintenance of a gas-power plant, and when the writer mentioned the ultimate figures, the chief engineer exclaimed that if these figures were true, "gas power has water power at a standstill." The answer as to the correctness of the figures was that since builders of gas engines and producers were willing to build plants under guarantee for the constructing and operating figures named, the figures could not be called into question.

That power can be turned out of a gas-power plant for less cost than from a water-power plant seems at first thought to be almost incredible, and in order to show how this may be, the writer begs to present the following analysis of costs. That we may be fair, we will take our data of the water power from a prospectus before us, detailing the cost and probable results in the development of a water power of 20,000 h. p.

From other data we find the estimate given in it compares favorably with several of the larger water powers that have been built, so it is fair to take this one as an example, and quoting from the figures therein, we have the total cost of the water-power plant as $3,555,000. This includes land, dams and canals, power station and electrical equipment, transmission lines, etc., of a plant ready for continuous operation. This is $177 per horse power.

The following estimate of the cost of operation, etc., is also taken from the prospectus:

Operating expenses per annum	$ 46,000
Interest $3,555,000 at 5%	177,750
Sinking fund	100,000
Repairs and depreciation	93,000
Taxes and insurance	25,000
Total	$441,750

This plant is located at a point requiring 100 miles of transmission line.

It is perfectly fair to assume the gas-driven plant as located within this distance of a very large center of population and yet put it directly at the mine. Hundreds of mines are as near Pittsburg, Cleveland, Columbus, Indianapolis, St. Louis, Omaha, Baltimore and numerous cities of from several hundred thousand to more than a million population. So we will place our gas plant at a mine, and will assume 65 cents per ton as the price of slack coal in the hoppers of the producer. This would probably be more profitable than shipping the slack, as the producer uses mostly slack, leaving the lump for shipment.

The cost of this plant of the same capacity as the water power ready for continuous operation would not exceed $2,325,000 or $116 per horse power; consisting of gas engines, by-product producers, electrical equipment, buildings, land, transmission lines, etc., as in the case of water power ready for continuous operation. The operating costs are very nearly as follows:

Labor	$ 50,000
Interest $2,325,000	116,250
Sinking fund	75,000
Repairs and depreciation	116,250
Insurance and taxes	15,000
Total	$372,500

The plant we are proposing is located at a bituminous mine and we would only consider a by-product installation, as herein lies a great source of profit.

Every ton of bituminous coal contains from 70 to 85 lb. of sulphate of ammonia. This is worth 3 cents per pound and holds steadily at about this price. From plants in operation it is found that the average net result from the by-products is fully $1.10 per ton of coal gasified, after deducting the cost of sulphuric acid, etc., used in the process.

It is expected that the water-power plant to which we refer shall deliver power to so varied a custom that it will be practically uniform, as the peak loads of lighting and railway plants shall be taken care of by local plants and storage batteries, so that a load factor of 85 percent may be assumed, at least for the sake of comparison.

A plant of 20,000 h. p. capacity will deliver say an average of 17,000 h. p. every day in the year, with a coal consumption of 96,798 tons. As each ton of coal nets $1.10 in by-products, this tonnage would yield $106,477. The coal bill for 96,798 tons at 65 cents is $62,918.

The net result then from the by-products is, the coal paid for and $43,559 placed to the credit of the expense account, and beside this gas sufficient to run 17,000 h. p. every day in the year.

The operating account will now stand	$372,500
Less profit on by-product	43,559
	$328,941

In order to make the comparison as nearly correct as possible, we will assume that each plant delivers 17,000 h. p. or 111,100,000 kilowatt-hours per annum and that this may be sold at 1 cent per kilowatt-hour, aggregating $1,111,000, with the following result:

	Total receipts	Operating expenses	Net receipts	Percentage of profit on investment
Water power	$1,111,000	$441,000	$670,000	18.85
Gas power	1,111,000	328,940	782,060	33.64

From these figures it would appear that, given a coal mine and a water power equidistant from, say, Chicago, the coal mine can sell slack coal to the gas plant at 65 cents (in which there is a profit), ship the lump at an increased price, transmit current and beat the water power 14.8 percent in results, not to consider the sale of coal direct.

It will be remembered that the above figures are only for the sake of comparison, as the cost of coal and the price of current will vary in every case, and the latter is put at an extremely low figure.

Granted these figures are true at this point of the discussion it will perhaps be said that a water power is so reliable and a gas engine so uncertain.

Is this true? The history of this country will show that there are great "dangers by flood and famine" of water. An unusually dry season and your power is gone; a wet one and something gives way; a cold one and your wheels are clogged with anchor ice. The vicissitudes of a water power entail serious considerations in a large investment.

What are the uncertainties of a gas-power plant? But few have kept pace with the development of the engine and producer and the general belief is that a gas engine is a very uncertain quantity.

There is not in the country a large gas-driven plant devoted exclusively to the development of electrical power that is one of more than 1,800 h. p., though there are now under construction engines in units up to 4,000 kilowatts for central stations. The largest gas-engine plant yet built is the one at the Lackawanna Steel Co.'s works at Buffalo, N. Y.

This consists of 16 2,000-h. p. units and eight 1,000-h. p. units. The latter is in fact an electric plant, as it is used

for electric light and power. There are all over the country smaller gas-driven electric plants, from 1 to 250 h. p., working with marked success and economy.

In all these plants there is nothing to indicate that a gas engine properly built and installed is not as capable of continuous work as a steam engine.

The writer has seen in England a large gas engine running on producer gas that had not stopped in 400 days and had run 700 with one stoppage.

There are in this country about a half dozen builders of gas engines who are prepared to install and guarantee the successful operation of engines of 2,000 h. p. and over. They will also guarantee sufficiently close regulation for successful work on electric lighting.

As they are among the oldest and most responsible engine builders in the country, their willingness to stand back of the gas engine should insure its reliability and place it on an even footing with the steam engine.

The gas producer is as simple in its operation and positive in its results as a boiler. There is nothing more to go wrong or get out of order than in a steam boiler. It requires about the same amount of attention and the same class of labor. There is one plant in successful operation of the by-product type in this country, one more now under construction and eight or ten in England. It is found that our coals work well treated by this process and the yield in by-products is about the same as in the plants abroad. The gas plant then taken as a whole may be considered fully as reliable as water power.

If there were a water power of 20,000 h. p. within 100 miles of any of the large cities of the country, how eagerly it would be taken up and millions expended in improving it! This is because our grandfathers ground their grain with the old wheel and it is a tradition that it is the one economical and reliable power.

Yet there are within less than 100 miles of many of these cities practically inexhaustible coal fields from which, unless figures lie outrageously and the guarantees of the great engineering companies in the country are of no account, power may be taken at less first cost and with greater economy in operation than from any existing water power, and, though water power may not yet be at a "standstill," surely it cannot compete with gas from coal except in the outlying districts.

With all this there is one great and gratifying feature in this exposition; it is that, as it is shown that power can be delivered more economically from the coal fields than from a water power, Niagara may be spared us and with it many more of the picturesque streams that are being chained to the wheels of ruthless progress.

Annual Report of the Comissioner of Patents.

In his annual report for the year ending June 30, the commissioner of patents gives some interesting figures. The total receipts for the year were $1,737,334, and the expenditures, $1,472,667; leaving a balance of $264,667, which was turned into the treasury. During the year there were received 52,323 applications for mechanical patents, 749 applications for designs, 174 applications for reissues, 1,846 caveats, 11,289 applications for trade marks, 1,236 applications for labels and 448 applications for prints. During the same period there were granted 30,266 patents, including reissues and designs; 1,436 trade marks, 1,028 labels and 345 prints were also registered. During the year 19,567 patents expired. There were also 5,154 allowed applications which were, by operation of the law, forfeited, for non-payment of the final fees.

THE SHEARING STRENGTH OF RIVETS.*

BY E. S. FITZSIMMONS.

On beginning our tests a number of pieces were prepared according to rules and formulae approved by mechanical engineers, and which are in use at the present time by many, if not all, of the prominent builders. While a number of the joints showed an efficiency above that rated for them, we found that invariably they showed a weakness at the edges of the plate, tearing out from edge of hole to edge of plate, so that from these pieces it was impossible to determine the actual shearing strength of the rivet. We at first concluded we had made an error in preparing the plates. However, on checking up our work we found conditions as follows:

A standard rule in practice, accepted generally by the builders, is as follows: For distance from center of rivet hole to edge of plate, take D × 1.5, which in our case would be diameter of hole $\frac{13}{16}$ × 1.5 = 1.21 in. This we increased slightly, making the lap 1¼ in.; and to further insure the shearing of the rivet, we used ½-in. plate with ¾-in. rivets in $\frac{13}{16}$ in. holes. Out of eight pieces tested with the rivets in double shear (four with iron, and four with steel rivets), each one of them fractured at the edge of the plate.

We next prepared four pieces with rivets in double shear, two having iron, and two steel rivets, one hand and one machine riveted, and instead of using the constant 1.5, we used 2, which would be as follows: 0.8125 × 2 = 1.625, or 1⅝ in.

On testing the first piece, using iron rivets in double shear, with a distance from center of hole to edge of plate as above, the result was as follows: Shearing strength of one rivet, 42,240 lb.; shearing strength per square inch, 81,481 lb.; hole elongated and end of plate distorted 0.16 in.

The next test resulted as follows:

Iron rivet in double shear: Shearing strength of one rivet, 40,920 lb.; shearing strength per square inch, 78,934 lb.; hole elongated and end of plate distorted about the same as first test.

We next tested a piece prepared the same as the two previous tests, except with steel rivets in double shear, which resulted as follows: Shearing strength of one rivet, 46,575 lb.; shearing strength per square inch, 89,843 lb. In this case the hole was elongated and end of plate distorted 0.34 in.

The next test was with steel rivet in double shear resulted as follows: Shearing strength of one rivet, 43,805 lb.; shearing strength per square inch, 84,500 lb.; hole elongated and end of plate distorted, 0.29 in.

The rivets in single shear resulted as follows:

1. Test iron rivet: Shearing strength of one rivet, 22,190 lb.; shearing strength per square inch, 42,824 lb.

2. Test iron rivet: Shearing strength of one rivet, 20,840 lb.; shearing strength per square inch, 39,409 lb.

3. Test steel rivet: Shearing strength of one rivet, 25,840 lb.; shearing strength per square inch, 49,845 lb.

4. Test steel rivet: Shearing strength of one rivet, 25,840 lb.; shearing strength per square inch, 49,845 lb.

It will be noticed by the above that the steel rivets in single shear showed exactly the same results.

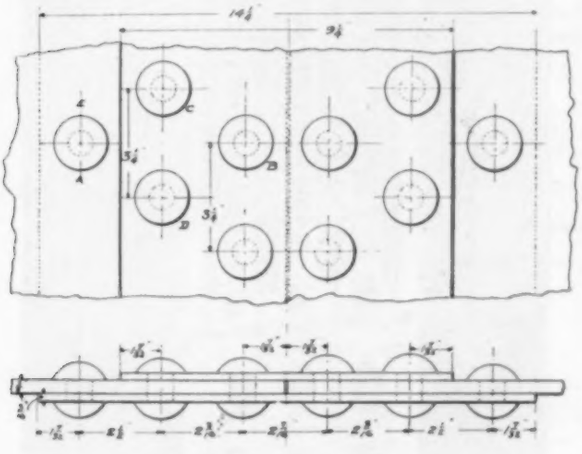
Following is a table showing the kind of rivets, diameter, and area of hole, shearing strength of one rivet, shearing strength per square inch, and increase in percentage for double over single shear. From this it will be

* Paper presented at Master Steam Boilermakers' Convention, Chicago, June 5-8, 1905.

noted that the increase for double over single shear averages considerably higher in iron rivets than it does in steel rivets; also, that the increase is greater for machine-driven rivets than for hand-driven, this being attributed to the frictional resistance of the plates, which is not so effective in the hand work:

No. of Test.	Kind.	Shear.	Diam.	Area Inch.	One Rivet.	Per Square Inch.	Increase Double Over Single Percent.
			In.		Lbs.	Lbs.	
1	Iron	Single	$\frac{13}{16}$	0.5184	22,190	42,824	— Hand
2	Iron	Double	$\frac{13}{16}$	0.5184	42,240	81,481	90 driven.
3	Iron	Single	$\frac{13}{16}$	0.5184	20,430	39 409	— Machine
4	Iron	Double	$\frac{13}{16}$	0 5184	40,920	78,934	104 driven.
5	Steel	Single	$\frac{13}{16}$	0.5184	25,840	49,845	— Machine
6	Steel	Double	$\frac{13}{16}$	0.5184	46,175	89,843	80 driven.
7	Steel	Single	$\frac{13}{16}$	0.5184	25,840	49,845	— Hand
8	Steel	Double	$\frac{13}{16}$	0.5184	43,805	84,500	69 driven

We next prepared a triple-riveted butt strap joint, using $\frac{3}{8}$-in. plates with $\frac{3}{4}$-in. rivets (iron) in $\frac{13}{16}$ in. drilled holes, as shown in the illustration herewith. This joint has a rated efficiency of 87.5 percent. Using a section of 6½-in. wide plate, $\frac{3}{8}$ in. thick, steel of 58,500-lb. test strength, the strength of the solid plate should be 0.375 × 6.5 × 58,500, or 142,593 lb.; 87.5 percent of this would be 115,145 lb. By actual test this joint developed a strength of 115,120 lb., only 25 lb. less than the calculated strength.



EXPERIMENTAL JOINT.

Now assuming that each rivet in this joint would sustain as great a load as in test No. 2 in the table, the shearing strength of the rivets in the section tested would be 42,240 lb. × 3 (number of rivets in double shear) plus 22,190 lb. (one rivet in single shear), or 148,910 lb., or 22 percent stronger than the ultimate strength of the section tested.

Next taking the net section at A on the illustration, we have 6½ in., or $\frac{104}{16} - \frac{13}{16} = \frac{91}{16}$, which divided by 104, the original or solid plate, gives 87.5, or the rated efficiency of the joint. However, our tests showed the net section not to be the weakest point, but the fracture occurred first at B, tearing out from the hole to the edge of the plate at the first row, the same as in the first tests, and next shearing off rivets C, D and E.

Now as neither the ultimate strength of the net section nor the shearing strength of the rivets was actually reached when rupture occurred, it will be evident to all that this joint can be made considerably stronger by adding to the distance from the center of the hole to the edge of the plate, or, in other words, using 2 as a constant instead of 1.5 in calculations for rivets in double shear, as we found necessary to do in our tests previously described to ascertain the shearing strength of the rivets.

The shearing strength of rivets we find to be about as follows:

For riveted plates:	Lbs.
Iron rivets, single shear, average per square inch	40,000
Iron rivets, double shear, average per square inch	78,000
Steel rivets, single shear, average per square inch	49,000
Steel rivets, double shear, average per square inch	84,000

In addition, we wish to invite your attention to the following points of interest:

(1) The noticeably greater increase for iron rivets in double shear over their single-shearing strength, as compared with steel rivets in double shear over their single-shearing strength.

(2) The greater increase for machine-driven rivets in double shear over hand-driven rivets, hand-driven not to be hammered after getting cool.

(3) The apparent necessity for deciding on a new constant in place of 1.5 for calculating the distance from center of holes to edge of plate for rivets in double shear at first row of holes.

BOOK REVIEW.

Electricians' Handy Book, by T. O'Conor Sloane, A. M., E. M., Ph. D. New York. The Norman W. Henley Publishing Co. 4½ x 6¾ in. 761 pages, 556 illustrations. Red leather. Supplied by *The Iron Trade Review* for $3.50.

This book, which is gotten up in pocketbook style, is really an elementary text book of electricity. The author has endeavored to cover the entire field of electricity from the elementary mathematics of the subject through alternating currents. The language of the book is extremely simple, and it is written down to the level of the most ignorant beginner in the science. Few formulae are used, and in most cases those which do appear in the book are translated into words immediately after their presentation. The author commences with a chapter on mathematics, well explained, and some of the mathematical expressions used in electricity are developed. He next takes up the subject of electric quantity and current, and the electrical circuit. There follows this discussion, a chapter on Ohm's law. In the chapter on primary batteries every known type of battery is shown and thoroughly treated. Various types of storage batteries are also taken up, their operation, troubles, etc., being discussed. Three chapters on magnets and induction follow, and then the author takes up the subject of generators and motors. Armature reactions, characteristic curves, generator and motor construction are treated in separate chapters, after which the alternating currents are discussed. Alternating current machinery is treated in a number of chapters. The care of dynamos and motors is the subject of two chapters, and station notes and distribution systems are also treated. The various types of electric instruments are described, and the subjects of lighting, photometry, electric railroads, electric heating and telephony are also gone into. While the trained electrical engineer might not find anything new in this volume, it undoubtedly would be read with considerable interest and be of value to electricians and beginners.

The elementary facts of the subject are all presented, and confusing mathematical expressions are omitted, although in the first chapter the author dwells on the advantage of a knowledge of mathematics. A feature which might prove annoying to the advanced worker is the omission of tables, of which there are few.

ALUMINUM ALLOYS.

M. H. Pecheux has contributed to the *Comptes Rendus* from time to time the results of his investigations into the alloys of aluminum with soft metals, and the following constitutes a brief summary of his observations:

Lead.—When aluminum is melted and lead is added in proportion greater than 10 percent, the metals separate on cooling into three layers—lead, aluminum, and between them an alloy containing from 90 to 97 percent of aluminum. The alloys with 93, 95 and 98 percent have densities of 2.745, 2.674, and 2.600 respectively, and melting points near that of aluminum. Their color is like that of aluminum, but they are less lustrous. All are malleable, easily cut, softer than aluminum, and have a granular fracture. On remelting they become somewhat richer in lead, through a tendency to liquation. They do not oxidize in moist air, nor at their melting points. They are attacked in the cold by hydrochloric and by strong sulphuric acid, with evolution of hydrogen, and by strong nitric acid when hot; strong solution of potassium hydroxide also attacks them. They are without action on distilled water, whether cold or hot.

Zinc.—Well-defined alloys were obtained corresponding to the formulae Zn_3Al, Zn_2Al, $ZnAl$, $ZnAl_2$, $ZnAl_3$, $ZnAl_4$, $ZnAl_8$, $ZnAl_{10}$, $ZnAl_{12}$. Their melting points and densities all lie between those of zinc and aluminum, and those containing most zinc are the hardest. They are all dissolved by cold hydrochloric acid and by hot dilute nitric acid. Cold concentrated nitric acid attacks the first three, and cold dilute acid the first five. The Zn_3Al, $ZnAl_8$, $ZnAl_{10}$, and $ZnAl_{12}$ are only slightly affected by cold potassium hydroxide solution; the others are strongly attacked, potassium zincate and aluminate probably being formed.

Tin.—A filed rod of tin-aluminum alloy plunged in cold water gives off for some minutes bubbles of gas, composed of hydrogen and oxygen in explosive proportions. An unfiled rod, or a filed rod of either aluminum or tin, is without action, though the unfiled rod of alloy will act on boiling water. The filed rod of alloy, in faintly acid solution of copper or zinc sulphate, becomes covered with a deposit of copper or zinc, whilst bubbles of oxygen are given off. M. Pecheux believes that the metals are truly alloyed only at the surface, and that filing lays bare an almost infinitely numerous series of junctions of the two metals, which, heated by the filing, act as thermo-couples.

Bismuth.—By the method used for lead, bismuth alloys were obtained containing 75, 85, 88 and 94 percent of aluminum, with densities 2.86, 2.79, 2.78, and 2.74 respectively. They were sonorous, brittle, fine-grained, and homogeneous, silver-white, and with melting points between those of their constituents, but nearer that of aluminum. They are not oxidized in air at the temperature of casting, but are rapidly attacked by acids, concentrated or dilute, and by potassium hydroxide solution. The filed alloys behave like those of tin, but still more markedly.

Magnesium.—These were obtained with 66, 68, 73, 77, and 85 percent of aluminum, and densities 2.24, 2.27, 2.32, 2.37, 2.47. They are brittle, with large granular fracture, silver-white, file well, take a good polish, and have melting points near that of aluminum. Being viscous when melted they are difficult to cast, and, when slowly cooled, form a gray spongy mass which cannot be remelted. They do not oxidize in air at the ordinary temperatures, but burn readily at a bright red heat. They are attacked violently by acids and by potassium hydroxide solution, decompose hydrogen peroxide, and slowly decompose water even in the cold.

Tin, Bismuth, and Magnesium.—The action of water on these alloys just referred to has been recently demonstrated on a larger scale, 5 to 6 cu. cm. of hydrogen having been obtained in 20 minutes from 2 cu. cm. of the filed tin alloy. The bismuth alloy yielded more hydrogen than the tin alloy, and the magnesium alloy more than the bismuth alloy. The oxygen of the decomposed water unites with the aluminum. Larger quantities of hydrogen are obtained from copper sulphate solution, apart from the decomposition of this solution by precipitation of copper at the expense of the metal alloyed with the aluminum. The alloys of aluminum with zinc and lead do not decompose pure water, but do decompose the water of copper sulphate solution, and, more slowly, that of zinc sulphate solution.—[The Mechanical Engineer, Sept. 2, 1905.

NEW CLUB HOUSE OF THE ENGINEERS' CLUB IN NEW YORK CITY.

The Engineers' Club has issued a pamphlet describing the new club house which is to be erected by it in New York city. The building when completed will be one of the finest and most luxurious club houses in the United States, and will occupy the land which has been purchased by the club at 32 and 34 West Fortieth street, between Fifth and Sixth avenues. Looking from the north windows will be seen Bryant Park and the new Public Library which is being built by the city. The front of the building will be simple classic design and constructed of white marble and red brick. A stylobate embraces the entire first story, and upon this rest four Corinthian pillars running up through two stories and supporting an entablature. This treatment frames the windows of the club room and the billiard room, the entire first three stories being built of marble.

EXTERIOR VIEW OF NEW CLUB HOUSE FOR THE ENGINEERS' CLUB.

Above these first three stories are the six stories devoted to bedrooms. These are treated in red brick of bright and cheerful aspect. Marble quoins are run up the sides of the building bringing out the outline, and all windows will have marble sills and lintels. The banquet hall is upon the 11th floor, and at this level will be an

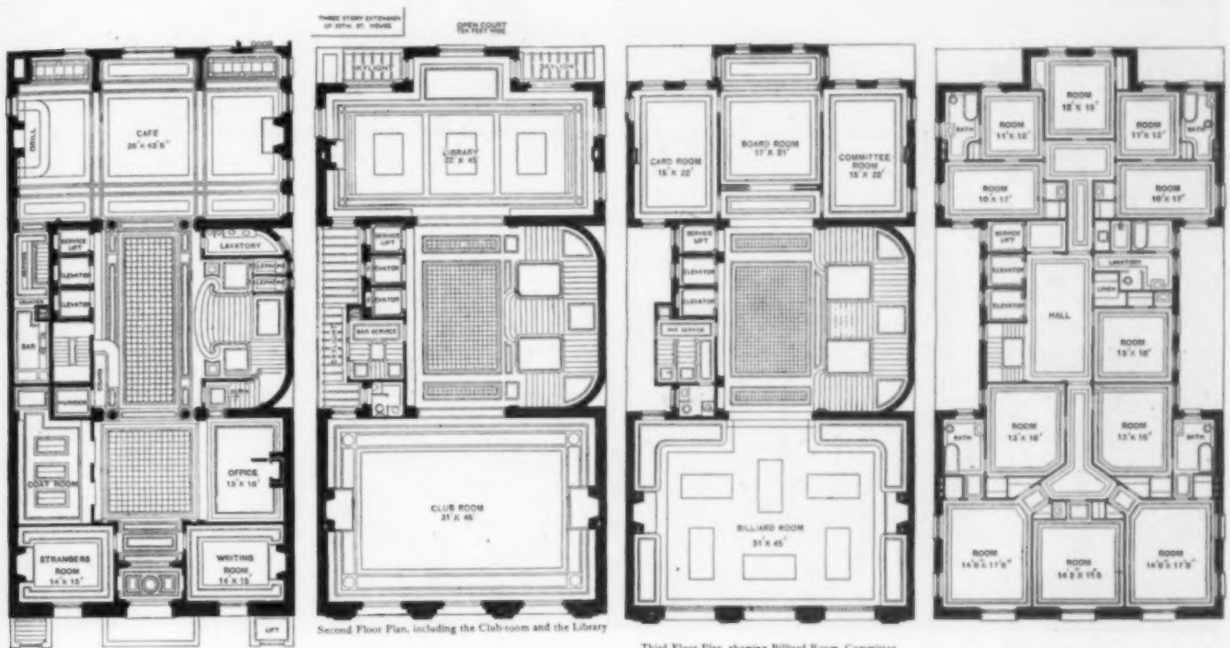
ornamental balcony. The building is finished off with a marble cornice and balustrade.

The club house is entered through a vestibule, from which access is gained to the foyer. On the first floor will be the reception room for strangers, reading rooms for members, the administration office and a coat room sufficient to care for 500 coats and hats. The grand stairway leads from the main hall on the right and runs to the third floor. A cafe with grill room will be installed at the end of the hall on the first floor. A cigar stand, a bar, four telephone booths, a lavatory, are also provided on this floor.

On the second floor is a large club room in the front of the building and the library at the rear. Service from the bar on the first floor will be obtained by an electric dumb waiter, which also reaches to the billiard room above. The billiard room will contain six tables and a raised platform for spectators. The billard room and the club room below it each will have an open ornamental fireplace at one end. On the rear of the third floor are to be three large rooms which will be set apart for cards, for the house committee and for the board of governors.

On the six stories above will be 66 bedrooms, so planned that the rooms may be used en suite or single. A bath is connected with or available to each bedroom. A general bath, toilet, and shower for common use will be placed off the main corridor. The private dining rooms are to be on the floor directly above the bedrooms, and the banquet hall will be installed on the eleventh floor, as heretofore noted. The twelfth floor is entirely given over to service work. Here are to be installed the kitchens, store rooms, butcher shop, refrigerator, etc. In addition there will be on this floor the servants' hall, housekeepers' rooms, servants' sleeping rooms and linen rooms. The roof is fitted so that in summer it may be used as a roof garden, where meals and refreshments will be served. Three electric elevators run from the top of the building to the bottom.

The illustrations show the exterior view of the building, the first, second and third story plans, together with a plan of a typical bedroom floor.



First Floor Plan, showing Café and Club Offices, etc.

Second Floor Plan, including the Club-room and the Library

Third Floor Plan, showing Billiard Room, Committee Rooms, and Card Room

Fourth Floor Plan, or Typical Bedroom Floor from Fourth to Ninth Stories, inclusive

TYPICAL FLOOR PLANS IN NEW CLUBHOUSE OF ENGINEERS CLUB.

THE ALL-STEEL MAIL CAR INDORSED.

That the Erie's new steel mail car appeals strikingly to postal employes is shown by a recent action of the Spokane, Wash., Branch Railway Mail Association. The association has most strongly indorsed the action of the Erie railroad in providing a car that will afford a measurable degree of safety to the mail clerks. The resolution adopted Sept. 4, 1905, follows:

Whereas, The Erie Railroad Company has had built for use on its lines a new type of all steel mail car, and

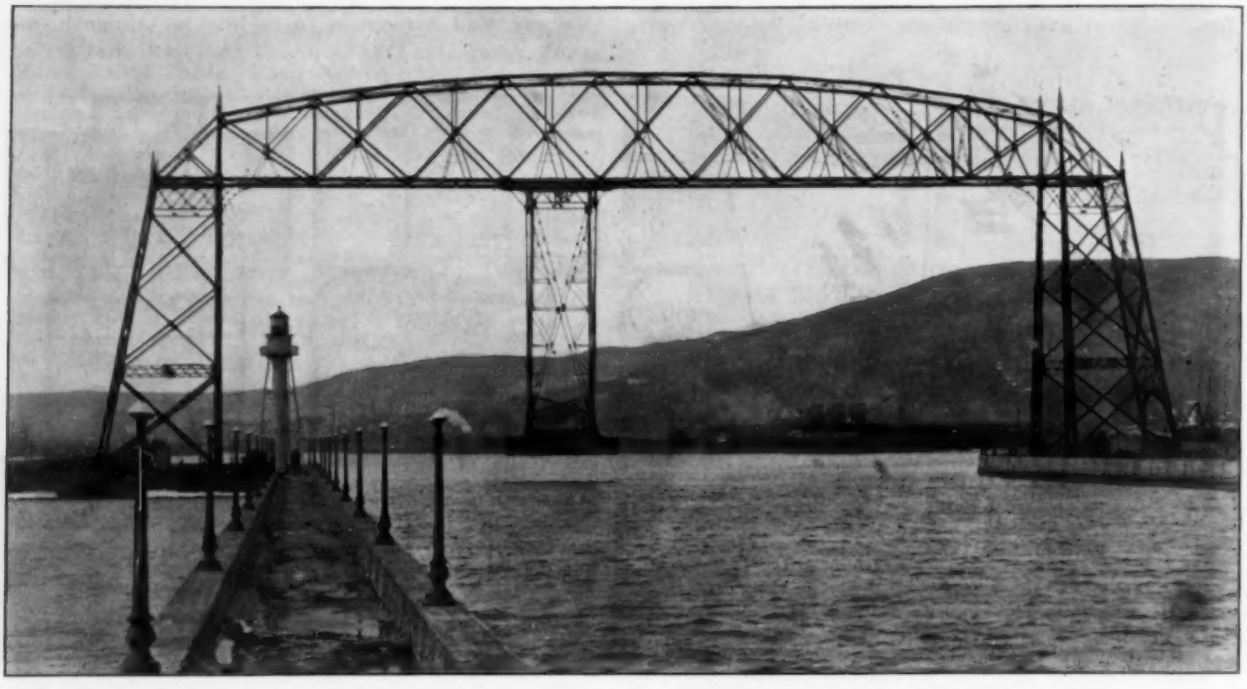
Whereas, The use of such mail car, by reason of its superior strength and non-inflammable qualities, will tend to greatly reduce the risk to life and limb of the employes of the postal service traveling in charge of the mails and minimize the danger of loss and destruction of the mails in case of accident or fire; now therefore be it

Resolved, That our delegates from the eighth division railway mail service to the national convention of the Railway Mail Association to be held in Cincinnati, use their influence to secure the passage by that body of a resolution commending the action of the Erie railroad in their construction of an all steel mail car, thereby showing their humane and progressive spirit in further safeguarding the mails of the United States and the persons in charge of the same.

Blast-furnace Explosion at Middlesbrough.—An explosion occurred at the Linthorpe Iron Works of Williams & Co., Middlesbrough, on Aug. 31, by which three workmen were killed and eight injured. Casting operations were going on at six furnaces, when No. 3, without the least warning, exploded, and part of the shell, 10 ft. in diameter, and six or seven yards from the top, was blown out. This, with a quantity of burning material from the furnace—coke, lime, ore, etc.—fell amongst a number of men working on the sand beds where the metal is run into pigs. The furnace is a comparatively new one, and was fitted with explosive doors, but the explosion took place below the charging line, and the weight of the material prevented the force of the explosion going up and escaping at the doors.—[The Mechanical Engineer, Sept. 2, 1905.

DULUTH AERIAL FERRY BRIDGE.

The Duluth ship canal, through which passes annually slightly more commercial tonnage than is carried through the famous Suez canal, was cut across Minnesota Point by the city of Duluth in 1871 and pile and timber cribs to hold its banks were constructed the following year. This canal was later adopted by the United States government which in 1901 widened it from 240 ft. to at least a width of 300 ft. and constructed substantial and permanent piers of crib work and concrete. The opening of the canal converted Minnesota Point into an island and the city accepted the responsibility of providing the inhabitants with adequate communication with the mainland. Until 1897, a rowboat ferry was maintained, but as the population of the Point steadily increased and it became popular for summer homes, a steam ferry for the transportation of passengers and freight across the canal was substituted in that year for the rowboats and has been in use ever since. The aerial bridge scheme came about through the imperative necessity of better communication with the Point at a less cost than was being paid for the steam ferry service. A tunnel was proposed but was abandoned on account of its prohibitory cost. A draw-bridge, a lift-bridge, a roller-bridge were proposed in turn but all failed to secure the necessary approval of the United States War Department, whose requirements demanded a method of transportation which in no way would impede the traffic through the canal. The suspended car transfer bridge at Rouen, France, was brought, in 1899, to the attention of the city engineer, who prepared a plan, adapting the general scheme to the conditions at the Duluth ship canal. The idea was received favorably by the United States War Department and the people of Duluth. A bond issue for the amount of the estimated cost of the structure ($100,000) was sanctioned by the State Legislature and a general specification and contract were prepared and let for the erection of the structure in 1901. The concrete piers to sustain the bridge structure were built under the original contract and the work was then abandoned by the contracting company. The city then spent some three years trying to find some one of sufficient engineering ability and courage to attempt the building of the bridge with a guarantee that it would work successfully, and a contract finally was entered into, in February, 1904, with the Modern Steel Structural Co., of Waukesha, Wis., for a riveted truss on riveted steel tower, the ferry car to be supported by an inverted steel tower, in accordance with designs made by the structural company's engineer for approval. The work was erected and completed during the winter of 1904-5. In the foundations of the bridge, there are 730 tons of concrete. In the eight piers, which extend below the water level of the lake, there are 24 anchor bolts, two inches in diameter, fastened by means of large washers to the bottom of the piers which hold the towers in position. The car will carry at one time 65 tons, which is equivalent to two fully loaded street cars, two loaded wagons with teams and 350 passengers. The bridge has a clear height, above the normal level of Lake Superior, of 135 feet. This height was fixed by the Lake Carriers' Association and will permit the passage of the highest masts. The truss at the center is 51 ft. high, making the total height of the bridge above the water 186 ft. The width, center to center of trusses, is 34 ft. and the clear spans 400 ft. The car platform is 34 x 50 ft. and contains, in addition to the space for a street car and two loaded wagons, two enclosed and glazed cabins of pleasing interior finish, each 7x 30 ft. The elevation of the bottom of the car above the United States government piers is 6 ft. and when the car is at rest, its whole length is over land; hence, it is not an obstruction or menace to navigation. Seven hundred tons of steel and over 100,000 rivets were used in the construction of the bridge.



AERIAL FERRY BRIDGE AT DULUTH, MINN.

The motive power of the ferry car is electricity, current being supplied from two separate sources having different cable systems, and in the case of the failure of one source, a switch, under the control of the motorman, enables him to turn on immediately power from the other. A further

safeguard against delays is provided by an adequate hand power, which can be used in the event of the failing of both sources of power.

The normal speed of the car is four miles per hour but the electrical machinery is capable of propelling the car at twice that rate. Thus the passage across the canal is made in a little over one minute. Two 40 h. p. motors, placed under the floor of the car, actuate two drums, each 9 ft. in diameter, on which are wound 1-in. cables, extending to the truss and thence over 9-ft. idle-wheels, through the inside of the lower chords to the towers, where they are fastened, producing the motion, which causes the car to run. The track to carry the car and hangers is arranged ingeniously, being enclosed on three sides within the box section of the lower chord, thus avoiding the danger of its becoming coated with snow or sleet in winter. There are four rails, within the two bottom chords, two in each and 32 wheels, arranged in pairs (eight pairs in each lower chord) roll on them, which carry the truck. As the bearings of these wheels, as well as those of the drums and idlers, have roller ball end thrust bearings, the friction of all the working machinery is reduced to a minimum. The hand power method of propulsion is applied by the use of lever handles, which by a series of gears and sprocket, communicate power to the drums on the car. The cost of the steam ferry boat service averaged $11,000 per annum. The cost of the ferry bridge will be $8,000, which includes operation, maintenance and the interest on the bonds issued for the construction of the bridge. Thus a sinking fund of $3,000 for the payment of the bond issue can be created, which in time will pay for the bridge. The especial fitness of this type of bridge to existing conditions doubtless will be appreciated more fully when it is known what enormous traffic passes under it. Twelve million tons in 7,000 vessels was the statement of the marine commerce for the navigation season of 217 days in 1904. "Considering the mean monthly freight movement during the season of navigation the Duluth-Superior harbor practically stands next to New York." On April 9, 1905, the ferry bridge transported 33,000 passengers, of whom 29,500 were carried between noon and 7:15 p. m., or in practically one-half day—7,781 in one hour and 814 on one trip.

The power necessary on the average trip is 18 h. p. The car operates as well when the wind blows 60 miles per hour as when no wind is blowing. The approximate cost of electric power to operate the bridge is $800 per annum.

The car makes 12 trips per hour between 5 a. m. and 12 p. m., and two trips per hour from midnight until morning.

The approach to the car is by means of a paved roadway and two cement walks of easy grade joining on the buffer platform. The safety of passengers is insured by two sets of gates, one set on the car and the other on the approach. Both are opened and closed by the motorman.

Inquiry for Pickling Tanks.—A correspondent wishes to know what experience foundrymen have had with pickling tanks. He has used wooden tanks for holding sulphuric acid and finds that they do not last long, the acid eating through them or rotting them in a short time. If any one has found a better method of holding this acid, we would like to hear of it, and also the best way of constructing such tanks. A lead lining to the wooden tanks has been tried, but with small success. The correspondent asks also if there has been any experience with the use of cement tanks, and if so, with what success.

AMERICAN FLOATING EXPOSITION.

Ship Will Make a Tour Around the World in the Interest of American Industries.

In any discussion touching on the export trade of the United States, the iron and steel industries of necessity hold high place, not only by reason of their aggregate value, but more particularly because of the very marked increase in volume recorded in recent years.

The developments of certain specific branches of the industry, any or all of which readily suggest themselves to the mind familiar with the trade, has been by such leaps and bounds that our manufacturers have excited the envy of our most determined commercial opponents, and at the same time have caused our competitors to redouble their efforts to replace our goods with their own manufacture. The only reason our total of exports has reached and remains at its present volume is that the markets of the world have broadened and the demands has correspondingly increased. In former years we were large consumers of foreign iron products, whereas at present we not only produce all we require but have reached the point where a foreign market is a necessity. Should one or more markets of the world be closed to our exports and our farmers be unable to sell their products abroad at satisfactory prices, it will mean that such overproduction will be thrown on home markets at reduced prices, and as our domestic trade for manufactures is based on the ability of our people to pay for goods ordered, the reduced revenue will compel less consumption.

Competition Active.

Every consular report, every traveler from abroad, every letter from foreign agents of our manufacturers, seems to reiterate the statement that our competitors fully realize the danger of allowing our goods a foothold in new markets, and the necessity of supplanting us where a wedge has been entered. Well directed and concerted action is being taken to deprive us, so far as is possible, of further expansion.

On the other hand, from the same sources we learn that our efforts are at best but half hearted. We have not learned by experience what foreign markets demand and, what is more important, the reason that certain goods are salable in certain territory—while perhaps another contiguous territory requires slight changes in the articles to make them suitable. A custom is always harder to overcome than a law. It is no longer possible for our manufacturers to tell their foreign customers that his product, as he turns it out, is suited to his home trade, and perhaps, to that of another section of the globe, and that if his customer wants his product he must use it as it is. Our competitors are not waiting to be told what is wanted in each territory, they are sending agents to find out so they can supply what is wanted.

Secretary Metcalf's Advice.

In a speech Secretary Metcalf, of the Department of Commerce and Labor, made in Atlanta last May, reference was made in the following words to the spasmodic efforts of our manufacturers with relation to their foreign trade.

"If it is necessary to have full and complete information as to the wants of the people, the kind of goods they need and use, and the manner in which the goods ought to be packed, then send agents abroad and get that information. Find out what your business rivals are doing, what inducements they are offering to secure the foreign trade; then see them, and, if necessary, go them one better.

"Your foreign competitors are sending their agents to

every part of the globe, one agent at times representing as many as 15 or 20 different lines of manufactures. They are establishing branch houses and are gaining a pretty strong foothold in the territory that by all the laws of trade belongs to us. You can displace them, however, and secure these markets for yourselves, if you do not delay too long.

"The time, gentlemen, is ripe for American invasion of foreign markets, especially the markets of the Pacific and it will be your own fault if you do not at once start an aggressive and determined campaign for the purpose of securing those markets."

Plans for the Exposition.

Along the lines of these suggestions, the Export Shipping Co., of No. 11 Broadway, New York city, has accepted the task as manager of the American Floating Exposition, of putting before manufacturers facilities to accomplish the work outlined by Mr. Metcalf. A brief outline of this plan appeared in *The Iron Trade Review* of Sept. 7.

The plans have been completed for chartering a 500-ft., 8,000 tons register, trans-Atlantic steamer, for a fifteen months' trip around the world. The voyage of the American invasion, or the American Floating Exposition, as it has been named, is to begin with the spring of 1906, and the itinerary includes stops at the principal ports of Great Britain, Russia, Sweden, Norway, Denmark, Germany, Holland, Belgium, France, Spain, Portugal, Italy, Austria, Greece, Turkey, Bulgaria, Egypt, India, China, Japan, Australia, New Zealand, Ecuador, Peru, Chile, Uruguay, Brazil, the northern South American countries, Central America and the West Indies, making a sea voyage of about 60,000 miles. The ship is to be equipped with three decks for purpose of displaying samples, and the space available for the purpose is about 20,000 square feet.

On the first or shelter deck will be shown samples of industrial art and novelties of all kinds, such as small tools, hardware, and articles of small bulk. The second or upper decks will be devoted to agricultural implements, vehicles, musical instruments and other bulky articles, while the third deck will contain machinery and heavy articles. On this deck both steam and electric power will be developed and supplied to the exhibitors throughout the vessel, so an actual working sample of a machine demonstrating its uses can be shown.

Room for Representatives.

The saloon deck will contain dining roms, library and school room, and the promenade deck has cabin capacity for the 200 representatives who will accompany the exhibits for the purpose of exploiting the goods on exhibition. The undertaking is not based on the principle that the manufacturers who engage in this trip are to make deliveries of goods sold, as the rules provide that the exhibits must not be sold or given away, but shall remain intact, and be on display at each port where the steamer may stop. These stops will be of from two to seven days' duration and during this time the ship will be thrown open to the inspection of invited guests, who will comprise the leading merchants of the countries visited.

The invitations will be distributed by the branch houses of the Export Shipping Co. in each country, the United States consular offices, the chambers of commerce and boards of trade, care being exercised to secure the attendance only of responsible merchants and jobbers who are anxious to enter into trade relations with the United States.

A catalogue will be published in different languages showing the kind of goods on exhibit by each manufacturer—the name of the representative in charge, and these catalogues will be distributed among prominent responsible merchants in each country, not only those of the port, but also in the interior.

It is natural to assume that this enterprise will attract considerable attention from all newspapers and journals, if only from the standpoint of a news item. This advertising will result in inciting and sustaining the interest of foreign merchants and aid the promoters in their aim to have merchants visit the steamer at each stop, who are interested in each and every kind of goods on exhibit, as well as serve to call the attention of the general public to the goods. When the foreign merchants are on the steamer the exhibitors will have an opportunity of personally advancing the advantages of their goods, be able to quote prices delivered in the country of consumption and explain the many little details which are so important and yet which cannot be properly brought out by catalogues or by correspondence. Every manufacturer knows he has a better chance to sell his goods if his customers visit his factory or warerooms, and here the showrooms are taken to customer.

The plan outlined is intended to be of lasting benefit to any manufacturer who has a salable article of general utility, and no better plan can be conceived for their introduction than by having agents in every country who will carry a stock of these goods, or, in any event, samples through which sales can be effected. Facilities will also be placed at the disposal of exhibitors for ascertaining the character and financial responsibility of foreign merchants or jobbers who desire to take up the agency for the goods displayed; and as the merchants abroad have pride in their commercial integrity, and the laws of other countries impose even greater penalties for those who try to evade their responsibility than do the laws of the United States, there is no valid reason why the American manufacturer should not allow reasonable business credit to those merchants abroad whose standing entitles them to credit, and no greater risk is assumed in doing so than in domestic trade where such facilities are extended, and in most cases the risk is not so great. Lack of capital cannot be urged as an excuse for refusing credit, as the Export Shipping Co. will arrange to finance the transactions for the exhibitors by taking time drafts or acceptances and advancing thereon the invoice value of goods sold.

Cost of the Trip.

This plan combines the greatest facilities with the least cost. The minimum amount of space to be allotted to any exhibitor is 40 sq. ft., costing $2,000. The board, transportation and berth for representative, including laundry service, is estimated at $500 for a fifteen months' trip, making the expense for traveling, transporting samples and incidentals on the basis of about $5 per day, which includes cost of space to display goods on steamer. Further, on account of the knowledge and experience that will be secured, it will be found impossible to employ a high-class representative to accompany the exhibit at less salary than would be demanded by a fair salesman employed for domestic business.

It is urged that exhibitors select as their representative some one of more than ordinary ability and whom they propose to have identified with their business after the termination of the trip, as the experience he will gain, as well as the knowledge of the trade conditions and demands of various countries, will be of great value; also, as facilities will be furnished for acquiring a knowledge of various languages, such representative will be able to correspond with customers in their own language.

A LARGE PORTABLE BORING, AND DRILLING MACHINE.

The Espen-Lucas Machine Works, Philadelphia, Pa., has recently brought out a number of portable machine tools for use in electrical manufacturing plants. One of these, a 72-in. portable boring, milling and drilling machine, is shown in the accompanying illustrations. This is a very rigid and heavy tool for use with high speed steel. It is built to carry an 18-in. high-speed steel, inserted tooth, cutter head. The machine has a large range of speeds and covers all the necessary speeds for drilling small holes as well as for boring large ones.

The spindle is made of hammered crucible steel 4 in. in diameter and feeds through a gun metal sleeve, having

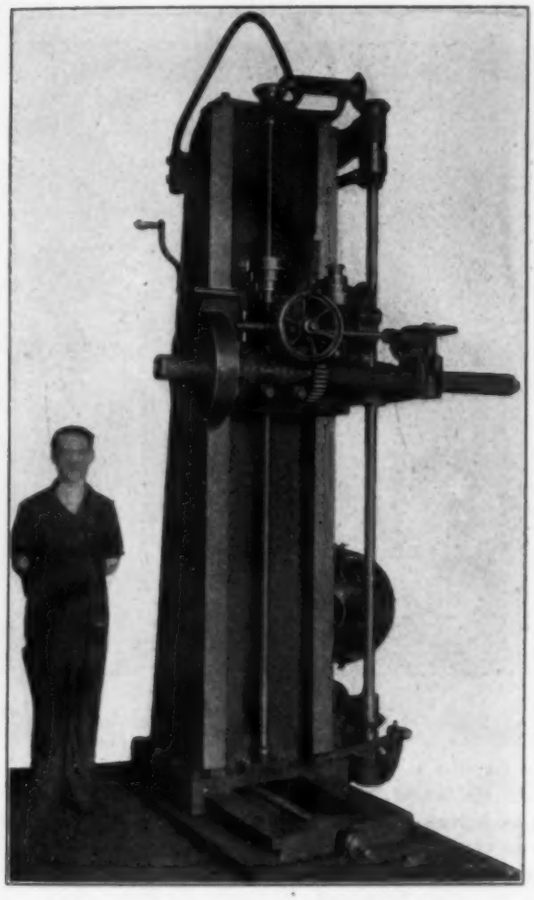


FIG. 1.—EPSEN-LUCAS PORTABLE MILLING, DRILLING AND BORING MACHINE, FRONT VIEW.

24 in. of feed. The feed motion of the spindle is accomplished by means of a spur gear working on a rack attached to the spindle sleeve. The spindle has a No. 6 Morse taper hole in the end and also a pin hole for retaining the bars and milling tools in place. The spindle may be raised or lowered on the column as shown and the column itself can be moved along the base of the machine in order to accommodate itself to different positions of the work at one setting.

The head has a vertical adjustment of 72 in. and can be securely clamped in any position for milling. The column carrying the spindle head has a feed in both directions and gives a motion of 24 in. to the spindle head for milling. The spindle itself has feed in either direction for boring and counterboring and is very powerfully geared for heavy work.

The machine is driven by a 3 to 1 variable speed Crocker-Wheeler motor. The gearing is made of hammered crucible steel cut from the solid and the bearings are all lined with bronze. The motor is mounted on the side of the column and drives by means of a silent chain. Fig. 1 is a front view of the machine and Fig. 2 a side view showing the position of motor and chain drive.

Journal of the Iron and Steel Institute.

The Journal of the Iron and Steel Institute for 1905 is a volume 5½ x 8¼ in., and contains 865 pages. The frontispiece of the book is a photograph of the Right Hon. Sir Bernhard Samuelson,

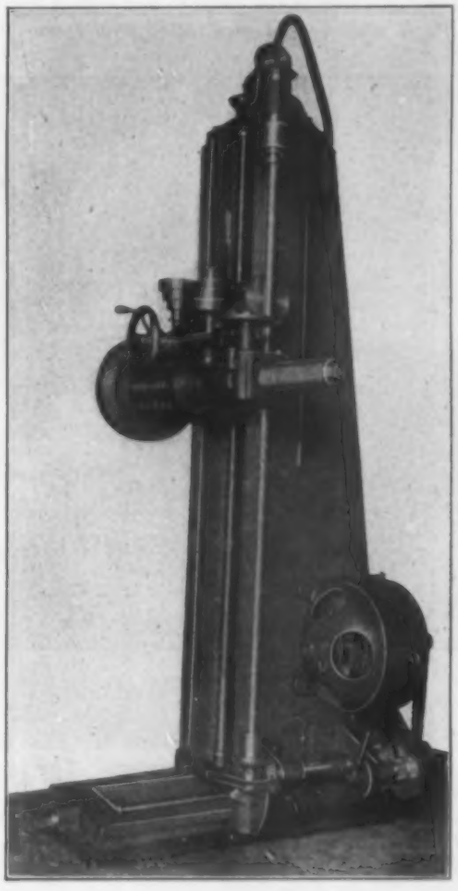


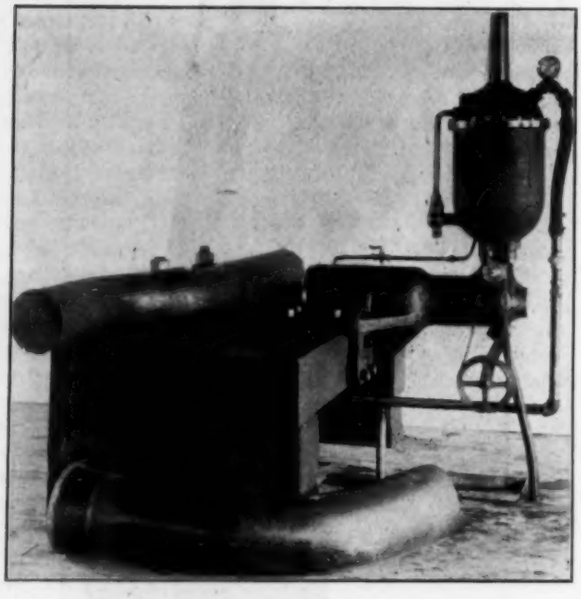
FIG 2.—EPSEN-LUCAS PORTABLE MILLING, DRILLING AND BORING MACHINE, SIDE VIEW.

Bart. F. R. S., president of the institution from 1883 to 1895, and who died on May 10, 1905. The contents of the book are comprised in two sections, namely, the minutes of proceedings and notes on the progress of the home and foreign iron and steel industries. The minutes of proceedings contain in addition to the minutes of the meeting, the papers presented at the various meetings, together with the discussions thereon. The second section contains notes on iron ore, mining, refractory materials, coal, charcoal, coke, liquid fuel and other fuels, notes on the production of pig iron, malleable iron and steel, and treatments of these metals, and nearly 100 pages of statistics of the iron and steel industries in all countries of the world.

PIPE BENDING MACHINE.

T. T. Slocum & Co., Wilmington, Del., build the pipe bending machine shown in the illustration. It is capable of exerting a force of 75 tons at the ram, for a distance of 12 in., when using air at 80 lb. pressure. This machine is fitted with a size five Caskey hydro-pneumatic engine similar to those used on the Caskey punches and riveters also built by the same firm. One of the features of this machine is the quick movement of the ram when coming up to the work or on the return stroke. This is accomplished by the air acting directly on the ram. Other advantages are the absence of high pressure piping, no freezing in cold weather and no piping to carry off the exhaust.

This machine has just been installed in one of the prominent ship yards of the country, and with it they made an S bend in 6 in. copper pipe, filled with rosin, number



SLOCUM PIPE BENDING MACHINE.

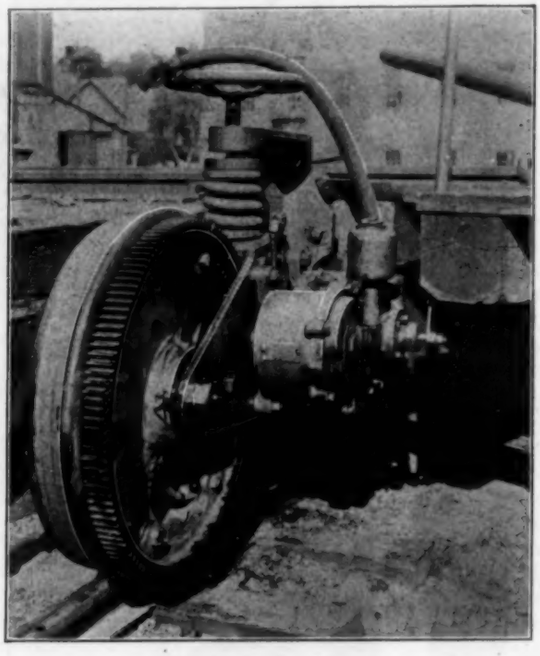
four gauge, in 25 minutes, and required one man and one helper, making a total time of 50 minutes. The appliance used formerly in this shop, a hand power screw press, required the labor of six men for three hours, so that the cost of the labor when using the machine, is but a small fraction of what it formerly was.

Production of Limestone.

Pennsylvania ranked first and Ohio second in the production of limestone in 1904, according to the estimates of David T. Day, published in a monograph recently issued by the United States Geological Survey. The limestone industry is by far the most important branch of domestic stone-production, the value of its output being almost half that of all stone quarried in this country. The limestone production of 1904 was valued at $31,996,415, as against $31,537,991 in 1903, and $30,231,003 in 1902. The small increase was largely due to a considerable falling off in the output of blast furnace flux, of which the value was $4,702,768 in 1904 and $5,423,732 in 1903. The states leading in flux production in 1904 were Pennsylvania, $2,058,018; Ohio, $558,579; Alabama, $361,503; Illinois, $324,998, and West Virginia, $244,535. The tonnage of 1904 was 10,657,038.

A LOCOMOTIVE TURN TABLE DEVICE.

The Pilling Air Engine Co., Detroit, Michigan, has brought out the device shown in the accompanying illustrations for turning a locomotive turntable. These can be placed on any turntable within two hours and will not interfere at any time with the swing of the table. They are built to operate either by electricity or compressed air. That shown in the illustrations is a 22-h. p. reciprocating, double-acting, oscillating engine running at 650 revolutions per minute, and driving through a train of gears. The cylinders are 4 in. in diameter by 4½ in. stroke. The gears are cut from steel forgings. The frame of the device consists of ⅞-in. wrought steel plates, on which is mounted a 33 in. standard car wheel, with a cast iron cut gear secured thereto. The bracket is a steel casting and the spring used for traction is a drawbar spring.



PILLING COMPRESSED AIR TURNTABLE ENGINE.

The traction is obtained by screwing down the stem to which the wheel is attached.

The reason for using such a large engine is that the device can be run with a very low pressure, namely 31 lb. The engine runs in oil, and has no parts which cannot be easily replaced by any machine shop. The engine is so connected that it may be run by means of air from a central plant or air from the locomotive through the train pipe. Many roads require the engine to turn themselves in order to test the air brake apparatus before departure. The device has been installed on a number of railroads, including the Canadian Pacific, the Erie, the Hocking Valley, and the Big Four. The last one to be installed was at Nyack on the Erie railroad, where it is handled by fifty-four different men in twenty-four hours. The engineer stays on the engine, the baggage man attends to the latch of the turntable and the brakeman connects the air hose from the train pipe at either end of the locomotive to the engine. He then throws on the operating lever, as shown in the illustration, and swings the table. The maker states that the device is practically "fool-proof" and can be handled by the most ignorant class of men.

INGERSOLL-SERGEANT MACHINERY FOR LONG ISLAND TUNNELS.

The two tunnels of the New York & Long Island Railroad, under East river, between New York and Long Island city, brings the total number of subaqueous tunnels entering Manhattan Island up to fourteen. The new railroad will connect with the present New York subway system at Third avenue and Forty-second street, at which point a large subterranean station will be built about 80 feet below the subway grade. Escalators will carry passengers from Long Island to the subway station and to the surface. At the eastern terminus, connection will be made with surface lines on Long Island

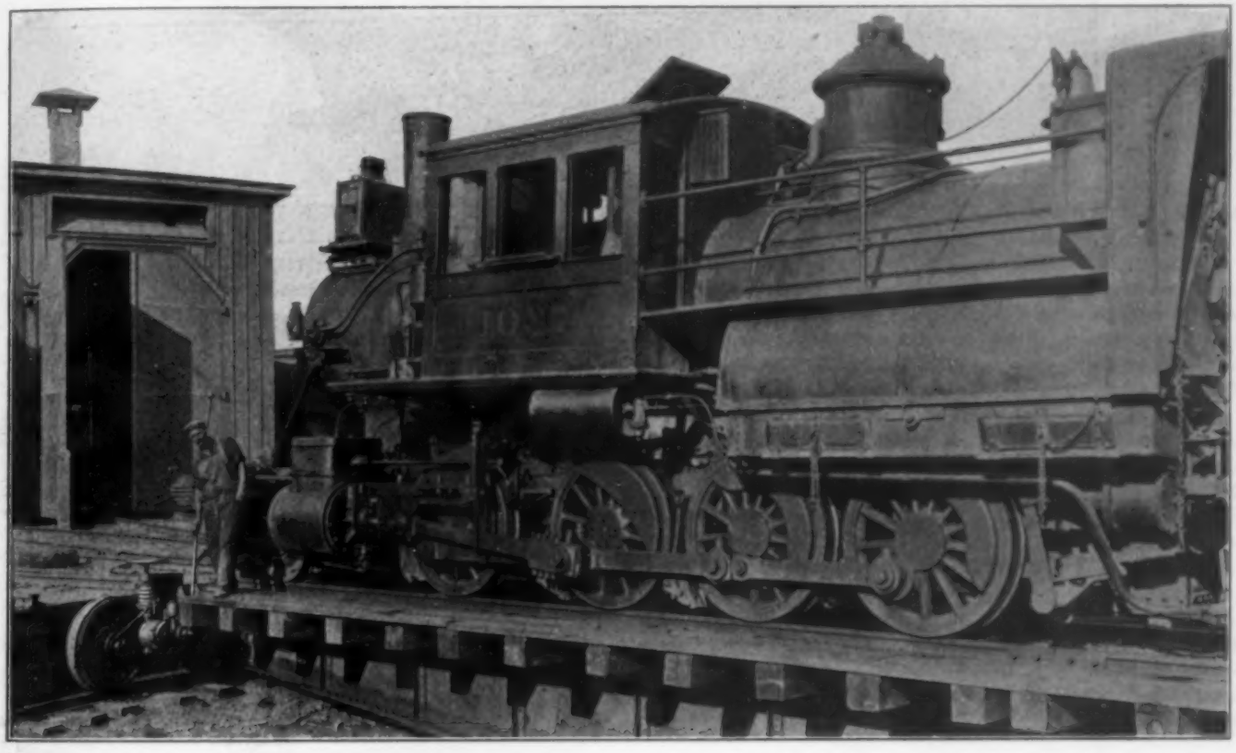
The Degnon Contracting Co. are contractors for the new tunnels and have just placed one of the largest machinery orders of recent times with the Ingersoll-Sergeant Drill Co., of New York.

This order includes 14 air compressors, of two different types. Eight are of duplex compound class "HC" pattern, with steam cylinders 16 and 28 in. in diameter, air cylinders 25¼ and 16¼ in. in diameter, and a stroke 16 in. Each unit has a free air capacity of 1,205 cubic feet per minute. The other six are of straight line class "A" type, with a 24-in. steam cylinder, 26¼-in. air cylinder and a stroke of 30 inches. The capacity of each is 1,444 cubic feet per minute. The aggregate free air capacity of the 14 compressors is 18,304 cubic feet per minute.

The shield method will be used in driving these tunnels. The straight line compressors will furnish air to the headings for keeping out the water, and will also supply intake air to the other machines. The compound units, drawing their air at the discharge pressure of the low pressure machines, will furnish air at high pressure to the rock drills and other machinery in the tunnel bores.

As at present planned, the work of driving these tunnels contemplates three shafts. One will be at the Long Island terminus; another at Forty-second street and the river front in New York. The third will be on Man-o'-War's Reef in East river and some interesting work will be done here in providing room for a power plant. Ultimately it is expected that quite a large island will be made here with the rock removed from the tunnel. From this central shaft, the bores will be driven in both directions. The 14 compressors will be distributed among the three plants.

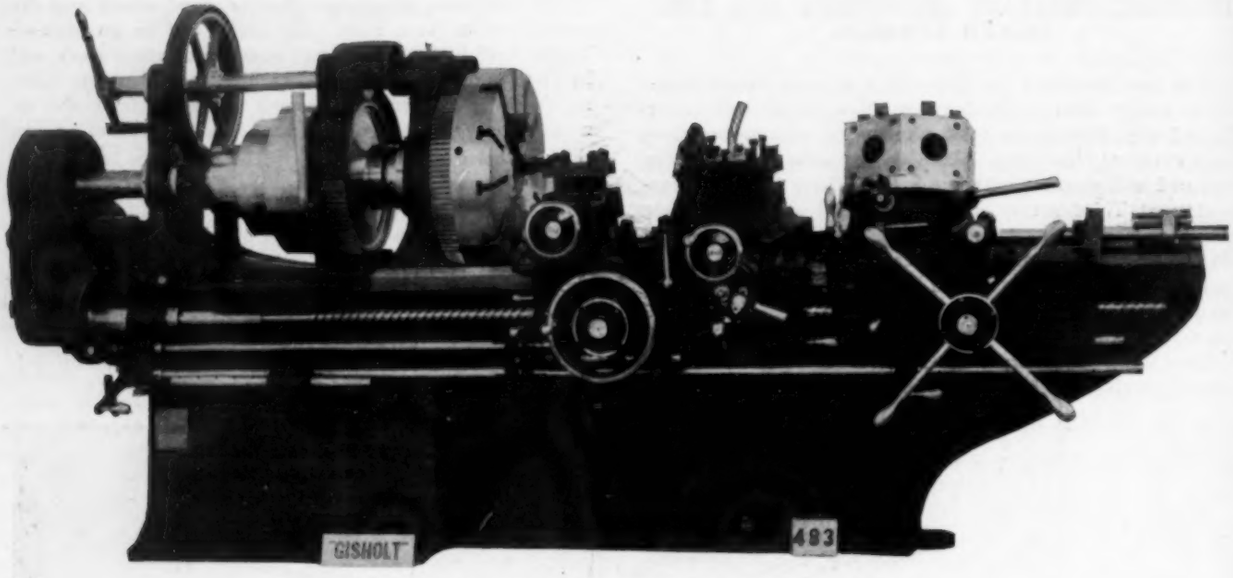
This last order makes a total of 54 Ingersoll-Sergeant air compressors in use or contracted for on subaqueous tunnels entering New York city. The aggregate free air capacity of these machines is 138,426 cubic feet per minute, and the pressures delivered range 30 to 150 lb. This company has furnished all the compressors for this class of work in New York and vicinity.



PILLING TURNTABLE DEVICE IN USE.

Iron Ores in the Philippines.

The possibilities of the Philippines as an ore producer are discussed in a current publication of the Geological Survey in the course of a treatise on the Philippine Mineral Industry by H. D. McCaskey, chief of the mining bureau of the islands. In Bulacan, Luzon, important deposits of rich hematite and magnetite iron ores have been known and worked by natives in a small way for over a century. Upon analysis these ores have been found to be very pure, many of them up to the Bessemer grade. They have been worked by the natives in the open entirely by smelting them in small coal furnaces with charcoal as fuel. No flux has ever been used, although vast quantities of limestone are at hand. The iron has been found excellent for plow points and shares and other small castings, and negotiations are now under way for the shipment of these ores to Japanese iron works. Coal deposits on several of the islands are quite extensive and of good quality.



GISHOLT LATHE WITH WING REST.

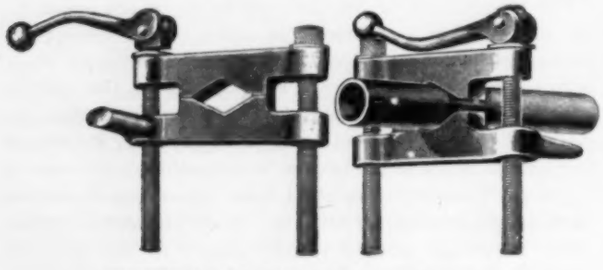
A HEAVY TURRET LATHE WITH WING REST.

Frequently in turning out such work as gas engine fly wheels it is necessary to turn a rim of large diameter on the outer face and also to face both sides of it. Ordinary turret tools or slide rest tools cannot accomplish this, and hence the machine shown in the accompanying illustration has been gotten out to meet the demand.

It is a regular standard Gisholt machine with a turret head and turret tool post. In addition to this on the left hand end of the carriage there is a wing supporting an additional tool post known as the wing rest. With this device gas engine fly wheels and similar pieces can be bored through the hub, the hub faced with the ordinary turret tools and at the same time the rim may be turned and faced by the tools in the wing rest. In many cases the back side of the hub does not require facing, and where it does a facing tool may be placed in the boring bar passed through the hub and the back side faced. The wing rest may be quickly detached from the machine when it is not in use.

A QUICK-ACTING LATHE DOG.

The Emmert Mfg. Co., Waynesboro, Pa., makes the quick-acting lathe dog, shown in the accompanying illustrations. The dogs are made of steel, the screws being made of tool steel. In adjusting the dog a wrench is not necessary, the screws being set up to approximately the proper distance by hand, the final adjustment being made by means of a cam lever, which is mounted eccentrically upon one of the screws. By throwing this lever over across the top of the dog, as shown, the upper jaw of the dog is forced down on the work, holding it securely. To release the work it is only necessary to lift the cam lever and draw it back.

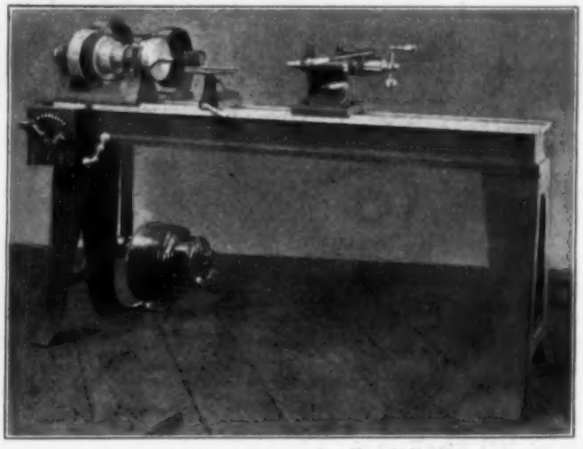


EMMERT LATHE DOG OPEN AND CLOSED.

A MOTOR-DRIVEN SPEED LATHE.

J. G. Blount & Co., Everett, Mass., are building and have recently placed on the market a motor driven speed lathe which is shown in the accompanying illustration. The motor is of the constant speed type and is set on the floor or on a suitable bracket. It is belted to a pulley which drives a countershaft at the back of the lathe head. This shaft is run in self-oiling bearings, mounted upon a swinging frame which is hinged to the back of the lathe and is provided with a screw operated by a ball handle at the front to tighten or loosen the belt which runs from the cone pulley on the countershaft to the cone pulley on the head spindle, as desired.

The head of this lathe has self-oiling, bronze bearings and may be placed on the bed as shown, or reversed as is usual for speed lathes. The tail-stock is arranged with screw and lever feed. The speed variations are the same as when the lathe is driven from a countrshaft overhead. The motor controller is counter on the front and at one end of the lathe bed, convenient to the operator. The placing of the motor on the floor makes the lathe available for use in open spaces, where there is no line shafting or suitable place to suspend a motor.

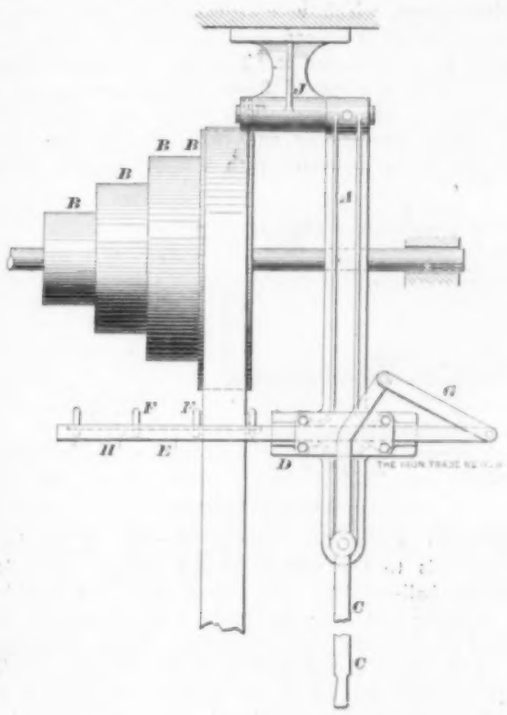


BLOUNT MOTOR-DRIVEN SPEED LATHE.

Some New Things for the Shop, Chiefly by Way of the Patent Office.

Belt Shifter for Step Pulleys.

Emanuel Kottusch, a resident of Switzerland, has invented the belt-shifter for step-pulleys, shown in the accompanying illustration. The shifter is fitted with as many forks as there are steps on the pulley and the bearer arm, for the rod is suspended so that it swings in a plane perpendicular to the longitudinal axis of the shafting, either on an axis fixed quite apart from the shafting, or on the actual shafting that carries the pulleys. In the form of the shifter illustrated, a forked arm A is hung so that it can swing from the bearing J, which is attached to the ceiling or other suitable place. The lever C for operating the shifter is attached to the arm A by means of a hinge pin upon which it can turn. The bearer arm carries a slide-bearing D for the shifting rod E. This shifting rod is provided with forks F facing the cone pulleys. It is also connected with the operating lever C by means of a link. The various forks are connected by means of



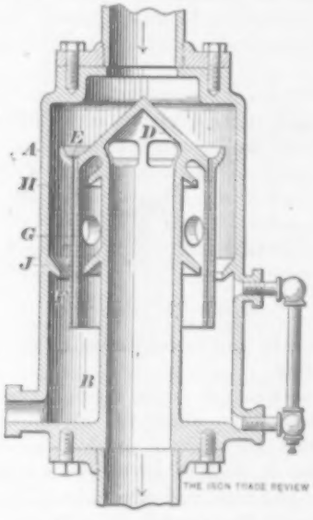
BELT SHIFTER.

a cross bar H passing through them, whose object is to strengthen them.

In operation the lever A is swung outward in a direction perpendicular to the shafting until the forks are clear of the belt. The lever C is swung to one side or the other until the part of the fork corresponding to the particular step to which it is desired to shift the belt, is over the belt. The bearer arm is then swung back to its original position. The operating lever C is pushed back, thus carrying the fork and the belt to the desired position.

Steam Separator.

Charles E. Huxley, of Chicago, has invented a steam and oil separator, which may be employed either for separating water from the live steam furnished an engine or for removing the oil from the exhaust-steam of an engine. The separator is designed for use in vertical pipes and is of a cylindrical form. It is shown in the accompanying illustration. The casing A is provided at its upper end with an opening, to which is connected the live steam pipe leading from the boiler. Its lower end is connected with the steam pipe leading to the engine. The lower part of the casing constitutes a chamber B, which will receive the oil or water removed from the steam, and is provided at one side with a discharge pipe for removing the oil or water. A vertical member C extends from the bottom wall of chamber B, and forms a steam passage which extends almost to the top of the casing A. This steam passage is provided at its upper end with a conical top D, the apex of which is located near the inlet of the casing. At the base of this conical top there is formed a shallow trough E, which will receive the free water contained in the steam, the steam striking the cone and the water falling by gravity into the trough. Suspended from the trough and surrounding the upper end of the steam passage C is an annular shell F, which is made of such diameter as to provide an annular chamber G between it and the steam passage C, and another annular chamber H between it and the wall of the casing A. This shell is made of such thickness as to allow a number of vertical passages to be made through it from the trough E so as to drain the water from the trough into the chamber B.



STEAM SEPARATOR.

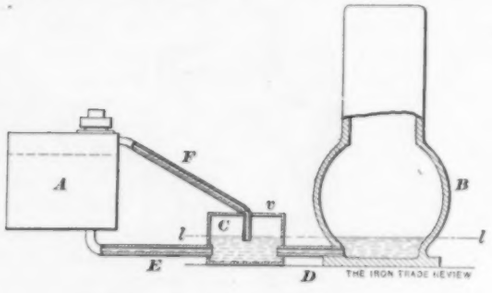
The trough surrounding the base of the cone D is made of less exterior diameter than the interior diameter of the casing, and the steam is spread out by the cone and passes between the trough and wall of the casing into the annular passage H between the shell F and the wall of the casing. The interior of the casing wall is made corrugated in order to hold the water removed from the steam and prevent it being carried along with the latter. The wall of the casing is provided on its interior with a flange J, which extends downward at its inner edge close to the shell F. Its function is to prevent water being lifted from the chamber B by reason of a sudden lowering of the pressure on the inlet side of the separator. The shell F is provided with a number of rather large openings above the level of the flange J, furnishing communication between the chamber H and the chamber G. The steam

passes from the chamber G through a number of openings K in the walls of the steam passage C, which openings are located below the cone D. The walls of the passage C are provided on their exterior surface with flanges projecting downward, the upper one of which constitutes a baffle-plate, against which the steam strikes in passing upwardly. This causes a retardation of the steam, permitting the free water remaining in it to drop by gravity. The lower flange retards any steam which may pass down below the ledge J and enter the chamber from underneath, and removes the water therefrom. This provides ample time and opportunity for the steam to free itself from water or oil and the greater bulk of the steam, namely that which passes through the openings in the shells F reaches the passage C through the openings, without coming in contact with the water or oil which has been separated from the steam.

A water glass is provided at one side of the chamber B, its upper end being above the level of the shell F. This indicates the level of the water in the chamber, thus allowing it to be drained off before it reaches such depth as to be in danger of being carried along with the steam.

Lubricator.

Herman Casler, of Canastota, N. Y., has patented a lubricator, shown in the accompanying illustration. The object of the invention is to provide a lubricating apparatus which will maintain a uniform supply of oil without the interposition of movable valves, pistons, or other movable parts. The flow of oil is governed by pneumatic



AUTOMATIC LUBRICATOR.

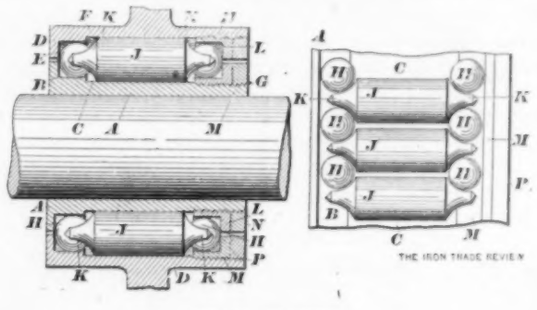
pressure, which in turn is controlled by the quantity of oil already delivered.

In the illustration A is an air-tight reservoir of any convenient size, into which the oil is first introduced. Extending from the bottom of this reservoir is an oil-conduit D and E leading to the enclosed crank-case B of an engine. An auxiliary reservoir C is placed between the two parts of the conduit pipe D and E. A pipe F extends from the auxiliary reservoir to the upper part of the main reservoir. The lower end of this pipe is placed at the level at which it is desired to maintain the oil in the engine crank-case. A vent *v* is placed in the upper portion of the auxiliary reservoir.

The operation of the lubricator is as follows: The main reservoir A is filled with oil to any desired level. The oil will flow through the conduit pipe and auxiliary reservoir until it has risen to the desired level in the crank-case. Air meanwhile has entered through the vent V and passed up through the pipe F to the main reservoir. When the desired depth of oil is obtained the lower end of the pipe F is covered and no more air can pass. A further flow of oil is thus prevented, as A is an air-tight chamber. As the oil is consumed in the engine its level falls until the orifice of the conduit F is uncovered to an extent sufficient to permit the passage of air through the pipe into the reservoir, and the partial vacuum being thus relieved a small quantity of oil will flow out, raising the level in the crank-case and intermediate chamber until the orifice of the supply pipe is again covered, thus restoring the oil level and cutting off the further admission of air as before. The operation is entirely automatic and takes place whenever an additional quantity of oil is needed in the crank-case.

Roller-Bearing.

A roller-bearing provided with a free, uncaged race and in which rollers and balls act in conjunction, the rollers being spaced by the balls, is the invention of Isaac A. George, of Hastings, Neb. The rollers are self-adjusting as to end thrust, and no one roller can take more shock than another. The bearing is shown in the accompanying illustration. It is here shown applied to a loose pulley. A sleeve A is secured to a shaft in any suitable manner. This sleeve is provided at one end with a marginal flange which forms an annular ball race B. It is also provided with an exterior race C, which is deeper than the race B. Both races are uninterrupted throughout the periphery of the sleeve, and the deeper race C is adapted to receive bearing-rollers, which will be described later. The hub D of the pulley is spaced slightly from the sleeve A and adapted to turn around it. This hub is also provided at one end with a marginal flange which corresponds with the flange on the sleeve. This flange also forms a ball-race, which corresponds and registers with the race B. The hub is also provided with a wider race F, which is



ROLLER BEARING.

adapted to receive the rollers. The race F in the hub corresponds to the race C in the sleeve, being deeper than the ball-race E. The sleeve A is also provided at the opposite end from the flange with an exterior thread G, and the hub has a corresponding interior thread cut in it. In the races B and E balls H are loosely placed, and in the combined races C and F there are located rollers J. The rollers are cylindrical and are provided with conical ends K, as shown, the conical ends being introduced between the opposing balls, as illustrated. The race at the opposite end of the sleeve and hub is formed of two rings L and M, provided with outer marginal flanges adapted to approach each other, the ring L being secured to the threaded surface of the hub and the ring M being threaded to the surface of the sleeve. These flanged rings are held in position by means of locking rings N and P, which are secured respectively to the sleeve and to the hub. The rollers are such length that they may have more or less end movement in the races C and F. No load is carried by the balls, and the entire load is sustained by the rollers. The rollers and balls are unobstructed in their movements, and the rollers will adjust themselves endwise, as may be required by the location of the load or the conditions of the surface to be traveled over.

Further uses of the bearing are its application to line shafts, or its application as an end bearing or as a thrust bearing. The construction of it is slightly different in these cases, although the general principle is the same.

NEWS FROM MANY INDUSTRIES.

New Buyers :—

The Forester Coal & Coke Co., Du Quoin, Ill., recently increased its capital stock from $50,000 to $100,000.

The Pittsburg Automatic Machine Co., Pittsburg, has been incorporated with a capital of $30,000.

The Bay State Iron Works, Erie, Pa., has been incorporated with $50,000 capital stock.

The Carmichael-Wilkes Range Co., Chicago, has changed its name to the Carmichael Range Co., and has increased the capital stock from $30,000 to $50,000.

The Friction Rail Brake Co., West Virginia, has been incorporated with $50,000 capital stock to manufacture a patent friction rail brake.

The Hussey Farm Tool Co., Indianapolis, Ind., has been incorporated with a capital stock of $100,000. The directors are: Ray W. Hussey, Joseph D. Hyde and Tilmand Smith.

The Arion Wire & Iron Works, Chicago, has been incorporated with a capital of $10,000, to manufacture metal work. The incorporators are: Nicholas C. Schommer, James E. Blaurock and Harry W. Hast.

The H. C. Chase Foundry Co., Chicago, has been incorporated with $5,000 capital stock to engage in foundry business. The incorporators are: H. C. Chase, W. H. Foster and F. E. Chase.

The Cain-Martin Machine Co., Louisville, Ky., has been incorporated to engage in the business of electrical and mechanical engineering. George E. Cain is president and W. E. Martin, manager.

The Carroll Iron Works, Chicago, has been incorporated with a capital of $25,000 to manufacture metal goods. The incorporators are: John H. Walker, Thomas J. Noonan and H. L. Marian.

The Hayley Valve Co., Buffalo, N. Y., has been incorporated with a capital of $20,000. The directors are: H. R. Watson, D. H. Donaldson and P. J. Overturf, all of Buffalo.

The Globe Wire & Iron Works, Milwaukee, Wis., has been incorporated with a capital stock of $10,000. The officers are: Adolph Trepter, president; Adolph H. Kuhl, vice president; Edward A. Lueck, secretary and treasurer.

The Universal Stamping Works, Chicago, has been incorporated with $20,000 capital stock to manufacture metal specialities. The incorporators are: S. B. Feurstine, S. Wickestein and R. F. Brady.

The Van Wie Pump Co., Syracuse, N Y., has been incorporated to manufacture pumps, etc., with a capital of $50,000. The incorporators are: Otis N. Van Wie, Chester T. Backus, J. Elmer McLoud and G. W. O'Brien, all of Syracuse, N. Y.

The Fountain Iron Mfg. Co., Fountain Iron, S. C., has increased its capital stock from $100,000 to $200,000. This stock will be sold and the proceeds used to construct a number of important additions to the plant.

The A. P. Carstad Boiler Co., Terre Haute, Ind., has been incorporated with a capital stock of $10,000 to make and sell steam boilers, etc. The incorporators are: Andrew P. Carstad, Julia P. Carstad and Charles Brumfield.

The American Brazing & Mfg. Co., Boston, has been incorporated with $40,000 capital stock. The incorporators are: George V. Jocelyn, Horatio A. Porter and George M. Faulkner.

The Cross Mountain Iron Co., Nashville, Sullivan county, Tenn., has been incorporated with a capital stock of $60,000. The incorporators are: C. P. Toncray, George E. Baren, P. T. Campbell, J. C. Anderson and E. S. Kendrick.

The Barnes Gear Co., Oswego, N. Y., has been incorporated with a capital of $50,000 to manufacture gears and supplies for automobiles. The incorporators are: Charles and Marcia A. Barnes, Thomas Moore, Charles A. Pentley and Fred V. Mardock, all of Oswego.

The Benedict Mfg. Co., Salamanca, Cattaragus county, N. Y., has been incorporated with $60,000 capital stock, to manufacture gas engines. The directors are: P. C. Benedict, Maud E. Benedict, Salamanca, and Mary J. Benedict, East Randolph.

The Rosa Machine Works, Santa Rosa, Cal., has been incorporated with $25,000 capital stock. The directors are: W. L. Whittaker, Alex Schelling G. E. Hart. The objects of the company include general milling, casting, blacksmithing, machine shop and foundry work, etc.

The Connellsville Basin Coal & Coke Co., Morgantown, W. Va., has been incorporated with a capital of $250,000. The incorporators are: George C. Bradshaw, William J. Crawford, Samuel A. Davis, J. H. Roelof, G. E. Moser Jr., all of Pittsburg.

The King Stove & Range Co., Sheffield, Ala., mention of which was made in our issue of July 27, is capitalized at $100,000. The company will manufacture stoves, ranges, hollow ware, metal castings, agricultural implements, etc. George E. King is the president and W. H. Martin, treasurer, vice president and manager.

The Northern Malleable Iron Co., St. Paul, Minn., has been incorporated with $200,000 capital stock. The incorporators are: Kenneth Clark, Cordenio A. Severance and Charles W. G. Withee, all of St. Paul. The directors are: Charles Deering, Cyrus H. McCormick, James Deering, Harold F. McCormick, John J. Glessner, William H. Jones, Richard F. Howe, Stanley McCormick and George W. Perkins.

The Elevator Safety Equipment Co., Buffalo, N. Y., has been incorporated to manufacture safety devices for elevators. The capital stock is $30,000. The incorporators are: Carl H. Guess, 13½ East Swan street; Porteus Cunningham, 162 Norwood avenue; Joseph E. Barnard, Ellicott square; Earl W. Bailey, 1233 Bailey avenue, all of Buffalo, and William H. Adams, Akron, N. Y.

Among the corporations organized in Maine last week is that of the Lake Torpedo Boat Co. Four separate certificates of organization were drawn up, one each for England, Germany, Russia and Italy. The purpose of the company is to manufacture and deal in submarine torpedo boats, torpedoes, guns and other devices relating to submarine war vessels. The capital stock of the corporation is $1,000,000, but nothing appears to have been paid in. The officers are: President, Fred P. Whitney, Washington, D. C.; treasurer, W. S. Lee, Augusta, Me. These with Henry J. Miller, of Elizabeth, N. J., E. E. Penney and A. P. Bibber, of Augusta, Me., constitute the board of directors.

The Holland-American Construction Co., Rochester, N. Y., has been incorporated to construct railways, power and electric plants, canals and other public works. The capital is $1,000,000, and the directors are: Newcomb Carlton, New York; George C. Smith and Walter D. Uptegraff, Pittsburgh, Pa.; Joseph H. Lukach, London, England; John N. Beckley, Chas. H. Palmer, J. George Kaelber, John F. Alden and George C. Ruell, Rochester.

The Speciality Mfg. Co., Lafayette, Ind., has been incorporated with a capitalization of $10,000,000, for the purpose of manufacturing and selling an automatic railroad switch and several devices for use on electric roads. The officers of the company are: William P. Jester, president; Charles E. Kendall, vice president; William R. Smith, secretary, and Frank Borsch, treasurer. The directors are: William P. Jester, Charles E. Kendall, Frank Borsch and

William R. Smith. The company has bought a lot on Fourth street at a cost of $15,000 on which it intends to erect a six-story office building. The switch is said to possess the advantage of being operated in three ways, from a tower at an interlocking plant, from the ground at the point of the switch by moving a lever and from the locomotive that is using the track. The company has not yet selected a site for its factory.

The Bay State Iron Co., of Erie, Pa., has been chartered in Pennsylvania. It will manufacture boilers, engines and similar articles. The men interested are: E. D. Burch, H. H. Vail, J. R. Kellogg, B. W. Burch, J. F. Downing, F. J. Leary, W. G. Kline, Isaac Baker, Frank Coyle, Marcus Marks, Frank Boyd, G. B. Kimberly, Charles Miller, J. E. Zusser, W. B. Convoise and A. B. Osborne. The capital is $50,000.

A branch of the Long-Turney Mfg. Co., Chicago, has been incorporated to carry on business in Rome, N. Y. The new company is capitalized at $50,000, and will manufacture automobile radiators, spiral tubing and other metal specialties. The incorporators are: Dr. W. L. Kingsley, who will be president of the new concern, Thomas H. Stryker, G. W. Turney and J. S. Haselton, of Rome, and J. B. Long, of Chicago. The factory will be located in the building just vacated by the Utica Industrial Co. The power for the new plant will be electricity, for which the building is wired, and the machinery which has been shipped to Rome will all be automatic. The company will make use of the product of the Rome Brass & Copper Mills, it being for this reason that Rome was chosen as a location.

Fires:—

The Danville & Western Railroad Co. is planning to rebuild the machine and repair shops at Danville, Va., which were recently destroyed by fire.

The Empire Forge Co., Buffalo, N. Y., sustained a loss of $5,000 by fire Sept. 22. The loss was fully covered by insurance.

Thirteen tenant houses belonging to Sloss-Sheffield Steel & Iron Co., near its furnaces at East Florence, Ala., were destroyed by fire Sept. 19 with a loss of over $3,000.

Fire in the manufacturing portion of Oakland, Cal., Sept. 19, caused a loss of $25,000 to the machinery and buildings of the Bay City Iron Works and of $2,000 to the Carft & Brandt Machine Shop.

Fire in the Bessemer department of the Illinois Steel Co., South Chicago, Sept. 26, destroyed about $25,000 worth of machinery and caused heavy damage to the building. Molten metal for a time fell in a torrent upon the machinery below the cupola and afterward hardened

The Featherstone Foundry & Machine Co., Chicago, has set a new record in the way of repairing fire damage. Although its plant was visited by a serious fire the morning of Sept. 14, the plant was operated the same day, and the blacksmith shop and a portion of the machine shop were started again the following morning. Contractors had the building under roof Sept. 20, a large force was at once put at work replacing the patterns destroyed and the entire plant is now in operation, with orders little delayed.

The pattern storage warehouse, of Mackintosh, Hemphill & Co., Pittsburg, was destroyed by fire Monday night. The building was four stories, 170 x 30 ft., and was located on the river side of the plant, a strong wind blowing towards the river preventing other portions of the plant from taking fire. The work of the city fire department was not as effective as usual, there being delay in getting in an alarm and much trouble from bursting hose. It is stated the loss will be from $150,000 to $200,000 on the patterns, $30,000 on the building and $20,000 on the equipment, all covered by insurance. The patterns were well covered by drawings, and can all be replaced. The firm builds engines and rolling mill machinery.

New Construction:—

The Wistrand Mfg. Co., Galvina, Ill., has under way several important additions to its works.

The Griffin Wheel Co., Chicago, is building additions to its foundries at a cost of $15,000.

The H. A. Peterson Mfg. Co., Chicago, has under construction a large addition to its plant.

The Tomlin-Harris Machine Co., Cordele, Ga., is doubling the capacity of its machine shop.

The Standard Connecting Rod Co., Beaver Falls, Pa., maker of finished connecting rods, cranks, shafts, etc., is building a large addition to its plant.

Chas. A. Palmer, Sacramento, Cal., has almost completed a new steel structural shop, the machinery for which has been secured.

The Wagner Mfg. Co., Sidney, O., is building additions which will give its plant about 70,000 sq. ft. of floor space. At present about 200 persons are employed.

A large machine shop is being added to the plant of the Penn Steel Works, Chester, Pa., which is enjoying the heaviest business in its history.

The Railway Steel Spring Co. expects to have the alterations at its plant in Oswego, N. Y., completed by the first of the year at which time it will be put in operation.

The Winget Concrete Machine Co., Columbus, O., is erecting a new plant at a suburb, Plain City, O., where it will shortly remove. Later a foundry will be added.

The Wm. J. Oliver Mfg. Co., Knoxville, Tenn., has purchased the factory adjacent to its works, and on that site will erect an extensive trolley car plant. Work on the new plant is to begin at once.

The Triumph Safe & Lock Co., Connersville, Ind., has practically completed its new building, 150 x 75 ft., which will be equipped with all labor-saving devices for the manufacture of fire and burglar-proof safes.

Field, Hinchman & Smith, architects, of Detroit, Mich., are drawing the plans for a building 175 x 336 ft. for the Weston-Mott Co., Utica, N. Y. The building will be heated by the blower system and modernly equipped.

The J. Stevens Arms & Tool Co., Chicopee Falls, Mass., has decided to wait until spring before beginning the erection of its new power plant at Sixteen Acres, so as to determine how much water power it can get there.

J. C. Maben, president of the Sloss-Sheffield Steel & Iron Co., announces that it is the intention of the company to build a new steel rail plant at North Birmingham, Ala., in the near future. The company now owns or controls seven furnaces in that district.

The American Can Co. is making preparations for a factory near the Eastern Steamship Co.'s wharf at Lubec, Me., and work on the foundation for the piers has been started. The structure will be 150 x 55, and will be made as nearly fireproof as possible with concrete floors.

The Baltimore & Ohio railroad has awarded to Ed. Brady & Son the contract for the erection of the large roundhouse, shops and other buildings at Riverside, Pa. The buildings will be of brick and steel with steel doors and will cost about $500,000.

The American Tube & Stamping Co., Bridgeport, Conn., has decided to build an addition 16 x 200 ft. to the billet mill, an addition 20 x 48 ft. to the shear shop and one 43 x 77 ft. to the boiler house. The work will be of steel and concrete construction.

The Western Malleable Steel Co. is pushing work on its new plant at Clark avenue and River street, Detroit.

and expects to have it running within a month. About 700 skilled men will be employed. The company's specialty is castings for pneumatic tools and a closely-knit steel tube used in bicycles and automobiles.

The W. P. Davis Machine Co., Rochester, N. Y., has purchased the old Falls Field Park site and will erect a plant at a cost of about $100,000. The new buildings will include a three-story machine shop 40 x 160 ft., a factory 160 x 142 ft., equipped with a 20-ton crane, a repair shop 100 x 50 ft., and a storage warehouse 140 x 40 ft. The improvements will require about a year for completion.

General Industrial Notes:—

The Herron & Bury Mfg. Co., Erie, Pa., has changed its name to the Bury Compressor Co.

The Atlas Engine Works, Indianapolis, Ind., has opened a branch office in Kansas City with Bertrand R. Clarke.

The Eagle Iron Co.'s furnace at Attalla, Ala., will resume making charcoal iron Dec. 1, after a long idleness.

The Sullivan Machinery Co., Chicago, has opened a branch office at Knoxville with E. L. Thomas in charge.

The Red River furnace, Clarksville, N. C., will blow in about Oct. 15.

The Jones & Laughlin Steel Co., Pittsburg, has made a denial of the newspaper reports that it had purchased the famous Aliquippa park from the P. & L. E. railroad.

The Platt Iron Works Co., Dayton, O., denies the current newspaper reports of its purchase of a large manufacturing site in that city.

The Elmore Furnace Co., Elmore, O., is now occupying its new building, 140 x 45 ft. A general machine shop business is conducted.

The Tennessee Coal, Iron & Railroad Co. expects to have its Alice furnace, now being repaired, in blast by Dec. 1. Furnace No. 2, at Oxmoor, will not go into blast this year.

The Lorain, O., plant of the National Tube Works made what is said to be a world record in the production of pipe Sept. 22, when in 10 hours No. 4 mill turned out 301 pipes.

Attorney-General Wade H. Ellis, of Ohio, will investigate the complaint that the International Harvester Co., Chicago, is operating in violation to the Ohio anti-trust law.

The Shenango Furnace Co., Sharpsville, Pa., has completed the re-lining of its No. 3 furnace, which will be put in blast about Oct. 10.

The Michigan Steel Boat Co., Detroit, Mich., has purchased the old Detroit United railway car barns adjacent to its present plant and will make a speciality of steel boats and canoes.

The Tennessee Coal, Iron & Railroad Co., Oct. 1, put its rolling mill at Bessemer, Ala., on a double force, running both night and day shifts.

Consul General Rodgers cables from Shanghai, China, that there is no longer any evidence of boycott conditions there and that American trade is active, particularly in the northern part of China.

The Firth-Stirling Steel Co., Pittsburg, has leased the melting department of the plant of the Burns Uniform Steel Co., at Latrobe, Pa., which it will operate in connection with its Demmler, Pa., works.

The iron and steel mills of Harrisburg, Pa., with a few exceptions, were closed this week for the celebration of Old Home Week. It was the first general suspension in that city for years.

The rod mill department of the Alabama Steel & Wire Co., Ensley, Ala., has been shut down during the past fortnight for the installation of the continuous rolls which will greatly increase the output.

The Tamaqua Mfg. Co., which operates a large plant for the making of breaker supplies at Tamaqua, Pa., has announced that hereafter it will conduct its plant as an open shop. Demands for recognition of a labor organizer not in employ of the company, in addition to a demand for a minimum wage rate, brought about the decision.

The University of Illinois, Champaign, Ill., has installed a machine for testing beams of steel and timber. It is capable of exerting a pressure of 600,000 lb., and is one of the largest machines of its kind in existence.

President Walter H. Whiteside, of the Allis-Chalmers Co., denies that there is likelihood of that corporation coming under the control of Eastern capitalists interested in the General Electric and Westinghouse companies.

Official announcement is made that the option on the plant of the Niles Car & Mfg. Co., Niles, O., held by Col. W. H. Power, organizer of the combine of American Car Manufacturers, has been formally accepted.

The steel mill of the Youngstown Iron & Steel Roofing Co., Hazelton, Pa., during the past year has set the unusual record of being idle but three days, two of which were holidays.

Announcement is made that the Union Pacific is to reopen the big rolling mills at Laramie, Wyo., making use of scrap iron being collected along its line. About 100 men will be employed.

C. H. McGiehan & Co. have moved their offices from 110 West Thirty-fourth street, New York, to more commodious quarters at 11 Broadway, Bowling Green building. The firm's specialty is the designing and building of automatic and special machinery.

The Hazelton & Donald Machine Co., Philadelphia, manufacturer of the Acme Metal saw table, has sold its business to the Hub Machine & Tool Co., of that city, which will continue to manufacture this machine as well as other specialties.

The plant of the Independent Rolling Mill Co., Cuyahoga Falls, O., has been purchased by H. W. Cole, treasurer of the Crown Drilling Machine Co., of Akron, and others. The consideration was $26,000. The plant has been idle for 18 months, but will be put in operation at once.

The Republic Iron & Steel Co. has started the 8-in. continuous mill of the Brown-Bonnell plant at Youngstown, which had been idle on account of scarcity of billets, the Bessemer plant being worked on rails. It is understood that open hearth billets were purchased by this mill.

The Bessemer Coke Co. has purchased the Mack coal lands, 100 acres in extent, near Masontown, Pa., at a cost of $120,000. The tract comprises a vein of the best Connellsville coking coal and adjoins the Griffin works of the company. Extensive improvements will be made in the Connellsville this fall.

About 3,000 tons of steel will be required for the Murphy power, steam heating and cold storage plant, located at the corner of Congress and Wayne streets, Detroit. The contract will be let early in October. This is said to be the largest amount of steel ever placed in a single building in Michigan.

The Moeschl-Edwards Corrugating Co., Covington, Ky., recently incorporated with a capital of $50,000, has purchased the business and plant of the Kentucky Iron Roofing & Corrugating Co., which will be managed and operated by Frank A. Moeschl and C. B. Edwards, both of whom have had about 20 years' experience in the roofing business.

The Syracuse Aluminum & Bronze Co., Syracuse, N. Y., which recently secured the plant of the Stearns Steam Carriage Co., of that city, has remodeled it into an up-to-date factory for the manufacture of aluminum, brass and bronze castings with a specialty of automobile and marine engine work. All equipment has been installed.

An old landmark in the steel industry of Youngstown has passed away in the filling up of the famous old "soup well," on the site of the new furnace of the Republic Iron & Steel Co. The "soup well" was a salt water spring, the water of which was renowned as specially adapted for quenching the thirst of mill workers. To its invigorating qualities was given the credit of keeping the old Hazelton mill in operation on the hottest days of summer.

At Knoxville, Tenn., Sept. 26, a number of representative iron men of the South held an informal conference for the discussion of trade matters. Thomas I. Stephenson, vice president and general manager of the Knoxville Iron Co., of Knoxville, was the leading spirit in the meeting. Companies operating in Richmond, Va., Anniston, Ala., Bristol, Tenn., Birmingham, Ala., and other points in the South had representatives at the meeting.

The University of Michigan has purchased from the Abner Doble Co., San Francisco, the tangential water wheel exhibition at the St. Louis Fair where it was awarded the grand prize. It will be installed in the hydraulic laboratory of the new engineering building, Ann Arbor, Mich., where it will be mounted in connection with a duplex pump for experimental purposes. The University of Wisconsin, the Michigan School of Mines and the University of Toronto have also purchased the 12-in. laboratory water motors which the Abner Doble Co. builds for experimental purposes.

Trade Notes:—

The United States Cast Iron Pipe & Foundry Co., at its Bessemer, Ala., plant, is now employing about 650 men, the largest force in the history of the plant, which is being rushed in every department.

The Whitehead & Kalles Iron Works, Detroit, Mich., has landed the contract for the steel cages and other fittings in the Idaho State Penitentiary at Boise. The contract aggregates about $9,000.

The Dayton Pneumatic Tool Co., Dayton, O., is filling an order from the American Car & Foundry Co., for 50 of its Green long-stroke riveting hammers. They will be used at the Madison, Ill., plant.

The American Steel & Wire Co. has placed a contract with the American Bridge Co. for 10 steel barges to be used on the Ohio. These barges draw only about 11 in. of water.

The Toledo Machine & Tool Co., Toledo. O., manufacturer of sheet metal working presses, drop hammers, shears and special dies, reports a material increase in its export business, particularly to Japan, England, Denmark and Germany.

The Ingersoll-Rand Co., of 11 Broadway, New York, announces the establishment of a branch office at Houghton, Mich., under the management of T. F. Lynch, who has for several years past represented the Ingersoll-Sergeant Drill Co., in the copper and iron districts of the north.

The Morgan Construction Co., 40 Exchange place, New York, reports the sale of six producers for heating large forges to the Babcock & Wilcox Co., at Bayonne, N. J., and four to the Pennsylvania R. R. Co. for their Altoona shops. Among other recent sales of their continuous automatic gas producers are two to the Cambria Steel Co., at Johnstown, Pa.

The Adrian Steel Casting Co., Adrian, Mich., which is making a specialty of light crucible steel castings, reports business for the first three months under the new management as unusually heavy. Orders are being filled for manufacturers of automobiles, gas engines, railway supplies and other light machinery. The capacity of the plant is about four tons of steel castings a day.

Trade Publications.

Walter Macleod & Co., Cincinnati, O., is distributing literature relating to the Buckeye heater and other labor saving specialties. These latter include oil burners for light and heat, oil furnaces and forges, whitewashing and painting machines, etc. The use of the Buckeye heater is particularly pointed out by means of a reprint from the *American Machinist* entitled, "A Great Feat in Shaft-Straightening." This describes the straightening of the shaft of the battleship Illinois at the Brooklyn navy yard in which the shaft was heated by the Buckeye heater.

The Cincinnati Milling Machine Co., Cincinnati, O., has issued a new catalogue describing its complete line of milling machines, and milling machine attachments. All types of milling machine are described and illustrated, including plain and universal. The company has recently added four new machines to the former line. A number of new attachments are illustrated, including one for high number indexing, for rack indexing, for cam milling, and for worm milling. All the older standard attachments are described in the book. The first 20 pages are devoted to descriptions of the various parts of the machines.

The C. & G. Cooper Co., Mt. Vernon, O., has issued a very handsome booklet, showing the various types of Corliss engines manufactured by it. It is 8¾ in. x 11½ in., and contains about 30 pages, each of which contains a full page illustration of typical installations of engines made by this company. A large number of different types are shown operating in all services, including mills, railway power stations, electric light stations, and other services. The book contains no descriptive matter, but the company will furnish on application data regarding any engine shown therein.

The Morgan Construction Co., 40 Exchange place, New York, has issued a pamphlet on "Producer Gas." It gives in a very few words all the advantages of gaseous fuel artificially produced, the uses of producer gas, etc. The following serves as an instance of the improvement wrought in the manufacture of steel by the development of fuel gas engineering: "Formerly in this business it required a ton of coal to melt a ton of steel. By the introduction of regenerative furnaces the coal required was reduced to 1,500 lb. per ton, and now with the best gas producers, it requires less than 800 lb., and the loss from oxidation is greatly reduced."

The Cleveland Punch & Shear Works Co., Cleveland, O., has recently brought out its catalogue No. 6. This is probably one of the handsomest, if not the handsomest, catalogue ever issued in the machine tool trade. It is 12½ x 9¼ in., and bound with flexible leather covers. Instead of the usual half-tone illustrations, each page has mounted on it carbon photographs of the machine described on that page. All the pages are finished in art work with appropriate designs, and are printed in two colors on a rather unique paper. The book is in loose leaf form, so that instead of issuing a new catalogue every little while the company need only mail a sheet to fit the catalogue describing the new machinery. This sheet may be inserted in its appropriate place in the book, the catalogue thus being kept up to date at all times. The machinery shown in the catalogue represents a very complete line of punches of various descriptions and sizes the size of solid frame punches ranging from 12-in. to 72-in. gap. A large line of horizontal punches are shown, and also multiple punches for guillotine plate shears. Other machinery shown consists of bending and straightening machines, angle shears, guillotine bar shears, universal shears, plate-bending rolls, rotary planers, plate planers and wall radial drills. The catalogue is well worth a place on the shelves of any engineer's library.